NOV 0 6 1990

5HR-13

CERTIFIED MAIL
RETURN RECEIPT MAIL

Marathon Petroleum Co.
5000 W. 86th Street
Indianapolis, Indiana 46268

Re: Marathon Petroleum Co.
IND 006 417 430

Dear Sir or Madam:

The purpose of this letter is to inform you of the November 7, 1990, date of the expiration of the national capacity variance for petroleum refinery wastes, K048-K052. As you are aware under the Third Third rule, EPA granted an additional three-month national capacity variance for these wastes (55 FR 22641, June 1, 1990). The variance expires on November 7, 1990.

As of November 8, 1990, you, as the generator of these wastes, must treat the K048-K052 wastes to BDAT standards prior to land disposal, unless one of these three situations exists:

1. You have received final approval for a case-by-case extension (RCRA Section 3004(h)(3) and 40 CFR 268.5) as published in the Federal Register, or

2. You have received final approval for a "no-migration" variance (40 CFR 268.6) as published in the Federal Register, or

3. You or the treatment facility has received a treatability variance (40 CFR 268.44) for the particular waste stream(s).

The Agency anticipates that it will not issue any final decisions on any petitions for variances or extensions prior to November 8, 1990. During the period of the national capacity variance, you should have been exploring and implementing alternatives to the land disposal of untreated K048-K052 wastes.

The Agency is committed to carrying out the mandate established by Congress in RCRA Section 3004 of the Hazardous and Solid Waste Amendments of 1984. We will be conducting inspections and taking subsequent enforcement actions appropriate to the nature of the violations relating to the Land Disposal

Restrictions regulations soon after the November 8, 1990, date. We strongly advise you to take any necessary steps to be in compliance with these important requirements on the effective date.

Sincerely yours,

ORIGINAL SIGNED BY
KARL BREMER

William E. Muno
Acting Associate Director
Office of RCRA

cc: Thomas Linson
Indiana Department of Environmental Management

ap 11/6/90 CW 11/6/90

	TYP.	AUTH.	IL/IN TECH. ENF. SEC.	MI/WI TECH. ENF. SEC.	OH/MN TECH. ENF. SEC.	IL/MI/WI ENF PROG. SECTION	IN/MN/OH ENF. PROG. SECTION	RCRA ENF. BR. CHIEF	O. R. A.D.D.	WMD DIR
INIT. DATE							SKS 11-6-90	11/6/90	11/6/90	

	TYPIST							
INIT. DATE	11/5/90							

File

STATE OF INDIANA

DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT

105 South Meridian Street
P.O. Box 6015
Indianapolis, Indiana 46206-6015

March 30, 1987

Mr. William Laque, Environmental Coordinator
Rock Island Refining Corporation
5000 West 86th Street
Indianapolis, IN 46268

Re: RCRA Permit Application
Rock Island Refining Corporation
Indianapolis, Indiana
IND 006417430

Dear Mr. Laque:

On November 12, 1986, the U.S. Environmental Protection Agency denied the Rock Island Refining Corporation's delisting petition for F006 wastes. Pursuant to that denial, the facility has six months from November 12, 1986, to bring hazardous waste management units into compliance with applicable federal and State requirements. This provision requires the facility to certify or recertify to the U.S. EPA and the State compliance with applicable groundwater monitoring and financial responsibility requirements.

In the event a RCRA permit is not sought for the F006 land treatment unit, the unit must close pursuant to an approved closure plan.

This office requests a written response from Rock Island Refining Corporation pertaining to the proposed RCRA compliance activities for the F006 land treatment unit. The response as to whether Rock Island will permit or close the Land Treatment Unit is requested within thirty days from the date of this letter.

If you have any questions, please contact Ms. Cynthia Moore at AC 317/232-3243.

Very truly yours,

Terry F. Gray

Terry F. Gray, Chief
Plan Review and Permit Section
Hazardous Waste Management Branch
Solid and Hazardous Waste Management

CM/ram
cc: Mr. Hak Cho, U.S. EPA, Region V
Mr. William E. Muno, U.S. EPA, Region V
Mr. Dave Koepper
Mr. Tom Russell

File - Compliance
Rock Island Refinery
IND006417430

5HE-12

OCT 2 1986

Guinn Doyle, Chief
Hazardous Waste Management Branch
Office of Solid and Hazardous
Waste Management
Indiana Department of
Environmental Management
105 S. Meridian Street
Indianapolis, Indiana 46225

Dear Mr. Doyle:

Enclosed are two memorandums from the United States Environmental Protection Agency (U.S. EPA) Headquarters which affect facilities in Indiana with delisting petitions.

The first memorandum discusses the U.S. EPA's modified interpretation of the F006 hazardous waste listing. This modified interpretation has made the delisting petitions for three facilities in Indiana moot. These moot petitions are for the Ford Motor Company, P.T. Components, and Colt Industries. It had already been determined by U.S. EPA Region V that the Ford sludge did not meet the F006 listing and was also not Extraction Procedure (EP) Toxic. The P.T. Components delisting petition was originally submitted for the F006 and F012 hazardous waste listings. According to Howard Finkle, the delisting contact in Headquarters for P.T. Components, the F012 was dropped out of the original delisting petition early on during the review of the petition by Headquarters because it wasn't applicable to hazardous waste processes at the facility. Mr. Finkle also stated that as part of the delisting process the facility had conducted a representative sampling of the surface impoundments and the analysis showed that the sludge was not EP Toxic. Mr. Finkle is to supply the Region with documentation on why the F012 was dropped and the sampling program used by the facility to show that the sludge is not EP Toxic.

The second memorandum discusses the status of informal delistings. Letters were sent by Headquarters to those facilities holding an informal delisting. Enclosed are the letters sent to the applicable facilities in Indiana. The two land disposal facilities in Indiana with informal delistings are Rock Island Refining and P.T. Components. As previously discussed, the P.T. Component delisting will probably be moot. According to Barbara Menking, the Headquarters delisting contact for Rock Island Refining, the informal

exclusion for this facility will be denied. Ms. Menking also stated that it appears that the facility did not actively pursue their delisting by submitting additional information. It is the Region's understanding that this facility does not have any groundwater monitoring program for its regulated land disposal units, i.e., treatment in surface impoundments and land application. According to the letter from Headquarters to the facility, Rock Island Refining must be in compliance with applicable RCRA and authorized State program requirements by November 8, 1986.

If you have any questions, please contact Mr. Ron Lillich at (312) 886-4460.

Sincerely yours,

William E. Muno, Chief
RCRA Enforcement Section

cc: Jim Traylor, IDEM
Hak Cho, Indiana Permits

5HE-12:Ron:lr:6/4460:9/30/86 #17

			OTHER STAFF	IL/IN UNIT CHIEF	SECT. CHIEF	L. OF	BRANCH CHIEF
INIT. DATE	9/30/86	10/1/86		JMD 10/1/86	10/2/86	WEM 10/2/86	

MUND

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 4 1986

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

MEMORANDUM

Titan
Rock Island

SUBJECT: Status of Informal Delistings

FROM: Steve Heare, Chief
Compliance and Implementation Branch, CWPE

TO: RCRA Branch Chiefs, Regions I-X

Attached you will find a copy of a letter or letters sent to those holding an informal delisting in your region. The body of each letter is the same. Basically the letters affirm the Agency's position that informal delistings are considered the same as temporary delistings. The letters also state that these delistings expire on November 8, 1986 but that petitioners who actively pursued their delisting by submitting additional information as required by 3001(f)(1) will be granted six months from the date of promulgation to come into compliance with RCRA if their petition is denied.

Questions on the attached letters should be directed to Tony Baney (FTS 382-4460). Questions on the status of individual petitions should be directed to Myles Morse (FTS 382-4782).

Attachments

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

AUG 28 '86

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

Mr. Lague
Rock Island Refining Corp.
P.O. Box 68007
Indianpolis, Indiana 46268

Re: Status of Delisting Petition (Number 0237).

Dear Mr. Lague:

In March of this year you received a letter from this Agency, signed by Marcia Williams and Gene Lucero, informing you that you had not been granted a temporary delisting. Following our reconsideration, this Agency is now of the opinion that your delisting petition should be considered as having been treated as temporarily granted. The Agency apologies for any confusion. Our files now indicate that your facility has been granted a temporary exclusion for the petitioned wastes.

Pursuant to Section 3001(f)(2)(B) of RCRA all petitions that have been temporarily granted, including yours, shall cease to be in effect on November 8, 1986 unless a final decision to grant or deny the petition has been made. My office is currently working toward a final decision on whether to grant or deny your petition and we plan to promulgate that decision in the Federal Register prior to November 8, 1986.

If your petition for delisting is granted on a final basis prior to November 8, 1986 then you may continue to handle the petitioned waste as non-hazardous within the constraints of the granting notice and any other applicable requirements.

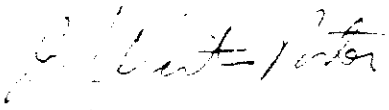
If your petition for delisting is denied based on technical grounds (i.e., the information which you submitted in support of the petition failed to show the waste to be non-hazardous) then you will have six months from the date of promulgation (pursuant to Section 3010(b)(1) of RCRA), to bring associated hazardous waste management activities into compliance with the applicable RCRA and authorized state program requirements. If you manage your petitioned waste in an on-site land disposal unit you are also subject to the requirements of Section 3005(e)(3) eighteen months after the date your exclusion is denied (i.e., within eighteen months of the date of promulgation). You must certify or recertify, to EPA and the state, compliance with applicable ground-water monitoring and financial responsibility requirements and file or amend Part B of your RCRA permit application in order to retain interim status (See 50 Federal Register 38946, September 25, 1985). If you do not manage your waste on-site you must insure that your waste is shipped to a RCRA hazardous waste management facility.

898-29

If your petition for delisting is denied based on your failure to provide specific information on the petitioned waste (you may refer to the public docket for the additional information requested and the basis for requesting this additional information), as required by Section §3001(f)(1), and requested on several occasions, including by letter in November, 1984 and September, 1985 and a Federal Register notice on February 8, 1984 (See 49 Federal Register 4802-4803) then your waste will be considered hazardous on November 8, 1986. On November 8, 1986 you must be in compliance with applicable RCRA and authorized state program requirements. If you manage your petitioned waste in an on-site land disposal unit you are also subject to the requirements of Section 3005(e)(3) on November 8, 1987. You must certify or recertify, to EPA and the state, compliance with applicable ground-water monitoring and financial responsibility requirements, and file or amend Part B of your RCRA permit application in order to retain interim status (See 50 Federal Register 38946, September 25, 1985). If you do not manage your waste on-site you must insure that your waste is shipped to a RCRA hazardous waste management facility.

The items addressed in this letter apply only to the wastes included in the above cited petition. Any other waste management activities in which you are engaged are subject to applicable RCRA and authorized state requirements. Notwithstanding any other provision of an exclusion or this letter, EPA reserves its enforcement and response authorities regarding waste handling, treatment and disposal that presents a threat to human health and the environment.

Sincerely,



J. Winston Porter
Assistant Administrator

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

APR 15 1986

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

Mr. George W. Pendygraft
Baker and Daniels
810 Fletcher Trust Building
Indianapolis, Indiana 46204-2454

Dear Mr. Pendygraft:

This letter is in response to your request, on behalf of Rock Island Refining Corporation, for an informal hearing on the proposed decision published at 51 FR 2526, January 17, 1986, and an extension of the comment period until May 18, 1986.

In anticipation of the legislative changes to the Resource Conservation and Recovery Act that would require the Agency to evaluate wastes for the presence of hazardous constituents other than those for which the waste is listed, the Agency requested additional data from Rock Island on January 6 and March 6, 1984. Rock Island was then notified on November 26, 1984, that the Hazardous and Solid Waste Amendments of 1984 were signed into law and that additional information was now required in order for the Agency to make a final determination on Rock Island's petition. An additional letter was sent on September 18, 1985, re-iterating the Agency's request for information and notifying Rock Island that all information must be received by November 15, 1985 or the petition would be denied for insufficient data. The Agency, to date, has not received the requested information. The Agency, therefore, believes it would be inappropriate to extend the comment period.

With respect to your request for a hearing, I would like to reserve judgment on whether to recommend to the Assistant Administrator for Solid Waste and Emergency Response to grant your request for an informal hearing until such time as Rock Island provides written justification of why such a hearing is necessary. In particular, §260.20(d) indicates that a person requesting a hearing must state the issues to be raised and explain why written

comments would not suffice to communicate the person's views. If you have any further questions regarding this issue, please call Doreen Sterling at (202) 475-6775 of my staff or Steven Hirsch at (202) 382-7703 from our Office of General Counsel.

Sincerely,

Eileen Claussen
Director
Characterization and
Assessment Division

Enclosures

BAKER & DANIELS

810 FLETCHER TRUST BUILDING

INDIANAPOLIS, INDIANA 46204-2454

317-636-4535

ALBERT BAKER 1874-1942 | EDWARD DANIELS 1877-1918 | JOSEPH DANIELS 1914-1972

WASHINGTON OFFICE
SUITE 600 1920 N STREET N. W.
WASHINGTON, D.C. 20036
202-785-1565

TELEX 4972139

WRITER'S DIRECT DIAL NUMBER:

Called 2/10 - Met w/

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

February 3, 1986

Eileen B. Claussen, Director
Characterization and Assessment Division
Office of Solid Waste (WH 562 B)
U. S. Environmental Protection Agency
401 M Street, SW
Washington, D.C. 20460

Re: Section 3,001 - Delisting Petitions (7)
Request for Public Hearing and
Extension of Time in Which to Comment

Dear Ms. Claussen:

On behalf of our client, Rock Island Refining Corporation, Indianapolis, Indiana ("Rock Island"), we request that the Administrator hold an informal public hearing with respect to the proposal to deny petitions and revoke temporary/informal exclusions, as published in Volume 51 of the Federal Register on January 17, 1986, pages 2526-29 (hereafter referred to as the "Proposed Delisting Rule"). Rock Island also requests that the comment period for this Proposed Delisting Rule be extended until May 18, 1986. In support of these requests, Rock Island states as follows:

1. The Administrator may, at his discretion, hold an informal public hearing pursuant to authority under 40 CFR §260.20(d). An opportunity for the public to provide oral comments is particularly appropriate as relates to the

Proposed Delisting Rule inasmuch as the basis for that rule has not been adequately stated in the Federal Register. An opportunity for oral comments would assist EPA in identifying the inadequacies of the rule.

2. An extension of time until May 18, 1986, in which interested persons may comment upon the Proposed Delisting Rule is appropriate and necessary, particularly in light of the ever changing requirements by which such petitions have been reviewed. As an example, EPA has only recently proposed an outline of how it intends to evaluate petitions dealing with organic wastes. See, e.g., the proposed rule and request for comment at 59 Fed. Reg. 49,943, et seq. (November 27, 1985). EPA's efforts to deal with petitions for the delisting of wastes containing organic materials is particularly applicable to Rock Island's delisting petition, as the presence of toxic organic chemicals are the only basis on which EPA could remotely assert a failure of the Company to have provided adequate data for purposes of its delisting petition. (Rock Island will demonstrate that there is no reasonable basis to believe that such toxic organic chemicals are present at levels that could cause the waste to be hazardous.)

Rock Island further believes it would be appropriate for EPA to hold the comment period open until May 18, 1986, as Rock Island and, most likely, other companies will be able to demonstrate during such comment period that EPA has acted inappropriately in denying their delisting petitions on the basis of incomplete information. The approximately ninety days extension requested by Rock Island should permit adequate opportunity for all interested persons to comment fully on that issue and to provide information to support positions as respects that matter. The fact that EPA has not canceled other petitions which have failed to meet its completion criteria is evidence that no disadvantage will result from this extension.

For the above reasons, Rock Island requests a public hearing with respect to the Delisting Rule on or by April 15, 1986, and an extension in the comment period for the Proposed Delisting Rule until May 18, 1986. Please call William E. Laque (317)872-3200), Rock Island's Environmental Coordinator of Environmental Affairs, or the undersigned, if

you have questions or need of additional information with respect to these requests.

Respectfully submitted,

BAKER & DANIELS

By George W. Pendygraft

George W. Pendygraft

cc: William E. Laque

STATE of INDIANA

ENVIRONMENTAL MANAGEMENT BOARD

INDIANAPOLIS 46206-1964

1330 West Michigan Street
P. O. Box 1964

November 22, 1985

Mr. William E. Laque
Environmental Coordinator
Rock Island Refining Corporation
P.O. Box 68007
Indianapolis, IN 46268

Dear Mr. Laque:

Re: Rock Island Refining Corporation
Variance Request
U.S. EPA ID# IND 006417430

In response to your variance request, dated July 26, 1985, regarding reduced liability coverage, I have concluded that given the current state of affairs within the insurance industry, there is no way to accurately determine the dollar amount of liability coverage necessary to cover the degree and duration of risk associated with your facility's operations. Inasmuch as the insurance industry itself cannot accurately estimate potential liability of such operations, and as U.S. EPA is still undecided as to what changes to make regarding liability coverage in general, any determination on our part would also of necessity be inaccurate.

Consequently, until your request can be assessed in a more accurate manner, no variance can be issued and Rock Island Refining Corporation must have and maintain liability coverage for sudden accidental occurrences in the amount of at least one million dollars per occurrence with an annual aggregate of at least two million dollars, as required in 320 IAC 4.1-22-24(a).

Very truly yours,

Ralph Pickard
Technical Secretary

JWS/tr
cc: Ms. Pat Vogtman, U.S. EPA, Region V
Mr. Joe Boyle, U.S. EPA, Region V

(0237)
ADDITIONAL INFO
RECEIVED
11/22/85

ROCK ISLAND REFINING
Corporation

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

November 15, 1985

Barbara L. Bush
Environmental Protection Specialist
Waste Identification Branch (WH-562B)
U. S. Environmental Protection Agency
Washington, D.C. 20460

Re: Supplementation to Rock Island Refining Corporation Delisting Petition

Dear Ms. Bush:

On or about September 18, 1985, Rock Island Refining Corporation ("Rock Island"), Indianapolis, Indiana, received your letter requesting additional information with regard to Rock Island's delisting petition for the filter cake generated at its refinery. There is no reasonable basis from which to conclude that additional constituents are present in this filter cake at levels of regulatory concern. Nevertheless, Rock Island will be providing the additional information requested by the enclosure to your letter. It should be understood, however, that any statement in this letter, Rock Island's willingness to supplement its delisting petition, and the providing of any such supplemental information now, or in the future, does not and may not be construed in any way to constitute (1) a waiver of any legal position or right that Rock Island has or might have, (2) an admission against interest by Rock Island, or an acquiescence by Rock Island with respect to any dispute between EPA, or any person, and Rock Island as to the status or completeness of Rock Island's delisting petition or the necessity for supplementation of such petition.

Rock Island has made a good faith effort to provide timely all the information required to support the delisting of its filter cake. A brief description of these efforts

follows. On October 16, 1981, Rock Island submitted its Petition for Regulatory Amendment to Exclude Hazardous Waste and supporting statement of Need and Justification for Exclusion. By letter dated November 18, 1981, Rock Island was advised by Todd A. Kimmell, Environmental Scientist, Waste Characterization Branch, EPA, that additional information would have to be provided by Rock Island with respect to its delisting petition. On December 14, 1981, Rock Island provided to Mr. Kimmell the requested information and, in his letter of February 19, 1982, George W. Pendygraft, Baker & Daniels, Rock Island's attorneys, provided other supplemental information with respect to Rock Island's delisting petition.

As reported in your letter, on March 11, 1982, James D. Bunning, Acting Deputy Associate Enforcement Counsel, notified EPA's regional offices that the Waste Characterization Branch, Office of Solid Waste, had preliminarily determined to grant Rock Island's delisting petition. Mr. Kimmell also informed Rock Island by letter dated March 12, 1982, that the EPA's Office of Solid Waste had completed its preliminary review of Rock Island's delisting petition and had determined that the vacuum filter cake was non-hazardous.

Subject to the understandings as stated above, on August 27, 1985, Rock Island's attorney, Mr. Pendygraft, met with you and Mr. Morse to discuss Rock Island's delisting petition. It is our understanding that you and Mr. Morse were advised that Rock Island would be filing additional information, including data, with respect to its delisting petition. Rock Island once again takes this opportunity to inform you that it will be providing data in accordance with the requirements described on page 19 of EPA's "Petitions to Delist Hazardous Waste," EPA/530-SW-85-003 (April, 1985). Rock Island's response to the items identified in the enclosure to your September 18th letter as being required for a complete petition are briefly discussed below.

1. All information under 40 CFR § 260.22(b) and (i) (1-12). This information was provided by Rock Island in its original petition as filed with the EPA. Nevertheless, that information will be updated and resubmitted in the format as recommended in EPA's Guidance Manual.

2. Description and schematic of all manufacturing processes occuring at the refinery. There have been no substantial changes to the manufacturing processes at the refinery since Rock Island submitted its petition in 1981. Nevertheless, an updated description and

schematic will be provided in the format as described in EPA's Guidance Manual.

3. Description and schematic of the wastewater treatment process in operation at the refinery. There have been no changes to the wastewater treatment process in operation at the refinery since Rock Island submitted its petition in 1981. Nevertheless, an updated description and schematic will be provided in the format as described in EPA's Guidance Manual.

4. An explicit statement verifying that the number of samples collected and analyzed is representative of any variation in constituent concentrations over time. All samples of Rock Island's filter cake previously collected and analyzed were representative of any variation in constituent concentrations over time, and all additional samples will be collected so as to be representative of any variation in constituent concentrations over time.

5. A detailed description of the sampling methodology and analysis methods used on the representative waste samples. All sampling methodologies and analyses will be done in accordance with SW-846 or other EPA approved procedures.

6. Data indicating that representative samples were tested for the ignitable, reactive and corrosive characteristics outlined in Subpart C 261.21-33. The filter cake is a solid and, accordingly, is not corrosive. As it does not, when ignited, burn so vigorously and persistently as to create a hazard, it is not ignitable. Tests on representative samples of the filter cake have demonstrated that it is not reactive. Additional tests for reactivity will be made on representative samples.

7. Total constituent analysis of the waste (complete acid digestion) for each of the EP toxic metals, nickel, antimony, beryllium, cobalt and vanadium on a representative number of samples. Tests for each of the EP toxic metals have been made on a representative number of samples. Additional tests for the

EP toxic metals and nickel, antimony, beryllium, cobalt and vanadium will be made on a representative number of samples.

8. Total analysis for cyanide on a representative number of samples; if the cyanide concentration exceeds 1 ppm, then tests for free cyanide should be run on representative samples. Appropriate cyanide tests will be made on representative samples.

9. Total analysis for each of the constituents shown in Exhibit 1 (some of these will already have been included in the tests for EP toxic metals) on a representative number of samples. Rock Island will conduct these tests on representative samples; however, absent objective criteria for such compounds, these tests, in Rock Island's opinion, are of little, if any, significance. EPA has neither proposed nor adopted any objective criteria with regard to the significance of these compounds in a waste.

10. An EP leachate analysis of the waste is required for each of the EP toxic metals, nickel and cyanide (using distilled water for CN) on a representative number of samples. (If the oil and grease level of the waste exceeds one percent, the EP for oily waste methodology should be followed during analysis.) Such EP analyses were included in Rock Island's petition. The oily EP has not even been noticed for public comment. Nevertheless, an oily EP for each of the toxic metals, nickel and cyanide will be made on representative samples of the filter cake.

11. Total oil and grease. The total oil and grease content of the filter cake will be determined using the protocol described in Appendix J of the Guidance Manual.

12. Total Organic Content (TOC). The TOC content of the filter cake will be determined only if the oil and grease in the cake is less than one percent. TOC measurements will be made in accordance with the protocol described in Appendix J of the Guidance Manual.

13. QA/QC data will be provided for at least one sample for each constituent analyzed.

14. Disposal scenario used for the waste generated prior to November 19, 1980 and current disposal method. This information will be provided as requested.

15. Average and maximum annual waste generation (in cubic yards or tons). This information will be provided as requested.

Please call George W. Pendygraft (317-264-1784) or the undersigned if you have any questions with respect to this matter.

Very truly yours,

William E. Laque

William E. Laque
Coordinator of Environmental Affairs

WEL:kjr
cc George W. Pendygraft, Ph.D., J.D.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

0237

SEP 18 1985

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

George Pendygraft
Baker & Daniels
810 Fletcher Trust Bldg.
Indianapolis, IN 46204

Dear Mr. Pendygraft:

The purpose of this letter is to request that you submit the data still considered necessary by EPA in order to make a final decision on your petition pursuant to 40 CFR §§260.20 and 260.22 of the RCRA hazardous waste regulations. In particular, on March 11, 1982, your company was granted an informal exclusion for its waste listed as EPA Hazardous Waste No. K049, K050, and K051. Our decision was based on an evaluation of the data in your petition, in regard to the original listing criteria, which demonstrated the non-hazardous nature of your waste. As a result of the Hazardous and Solid Waste Amendments enacted on November 8, 1984, delisting petitions must now address additional factors and constituents, other than those for which the waste was originally listed, if there is a reasonable basis to believe that they may be present in the petitioned waste at levels of regulatory concern. Furthermore, all temporary exclusions for which a final decision has not been made will expire on November 8, 1986. In anticipation of these Amendments, the Agency requested additional information from you in a letter on January 9, 1984. This letter outlined the data still needed in order to complete your petition. An additional request was made on November 26, 1984, after enactment of the Amendments. Today's letter is our final request for this information. Enclosed is a list which again outlines the specific information still needed in order to complete our evaluation of your petition.

In order for the Agency to have sufficient time to evaluate the additional data and propose and finalize an exclusion in the Federal Register by November 15, 1986, you must submit the remaining information by November 15, 1985. If we do not have a complete petition on file by this date, the Agency will propose to deny your petition in the Federal Register on or about January 2, 1986, due to insufficient data. We have been giving petitioners the option of withdrawing their petitions instead of publishing a denial notice in the Federal Register. If you prefer this option, you will need to send a letter to us retracting your exclusion petition and stating that your waste will be considered hazardous and managed as such.

If you have any questions regarding the data requested below, please do not hesitate to call me at (202) 475-6776.

Sincerely,

Barbara L. Bush

Barbara L. Bush
Environmental Protection Specialist
Waste Identification Branch (WH-562B)

Enclosure

ENCLOSURE FOR PETROLEUM REFINING WASTES

The following items are required in order to have a complete petition:

1. all information under 40 CFR 260.22(b) and (i)(1-12);

2. a description and schematic of all manufacturing processes occurring at the facility which can contribute to the wastestream petitioned for exclusion (if any changes to the process have been made since submission of the petition);

3. a description and schematic of the wastewater treatment process in operation at the refinery (if any changes to the process have occurred since the December 14, 1981 information submission);

4. an explicit statement verifying that the number of samples collected and analyzed is representative of any variation in constituent concentrations over time, and the basis for such a conclusion;

5. a detailed description of the sampling methodology and analysis methods used on the representative waste samples;

6. data indicating that representative samples were tested for the ignitable, reactive, and corrosive characteristics outlined in Subpart C 261.21-23;

7. total constituent analysis of the waste (complete acid digestion) for each of the EP toxic metals, nickel, antimony, beryllium, cobalt, and vanadium on a representative number of samples;

8. total analysis for cyanide on a representative number of samples; if the cyanide concentration exceeds 1 ppm, then tests should be run for free cyanide on representative samples;

9. total analysis for each of the constituents shown in Exhibit 1 (some of these will already have been included in the tests for EP toxic metals) on a representative number of samples;

10. an EP leachate analysis[a] of the waste for each of the EP toxic metals, nickel, and cyanide (using distilled water for CN) on a representative number of samples;

---

[a] If the oil and grease level of the waste exceeds one percent, the EP for oily waste methodology should be followed during analysis.

11. a determination of the total oil and grease content of the waste by testing a representative number of samples (but in no case less than four) using Method No. 502.D of Standard Methods for the Examination of Water and Wastewater, 14th Edition, enclosed in the attached package;

12. a determination of TOC of the waste[b] by testing a representative number of samples (but in no case less than four) using Method No. 9060 from Proposed Additions to Test Methods for Evaluation of Solid Waste, SW-846, 2nd edition, enclosed in the attached package;

13. QA/QC data on at least one sample for each constituent analyzed;

14. disposal scenario used for the waste generated prior to November 19, 1980 and current disposal method;

15. average and maximum annual waste generation (in cubic yards or tons).

If after reviewing the data specified above the Agency finds that organic toxic constituents or other toxic metals are used in your facility's processes, you may be requested to submit representative test data quantifying these constituents in the waste.

---

[b] The TOC analysis should be made only if the total oil and grease level is less than one percent.

EXHIBIT 1: CONSTITUENTS OF PETROLEUM REFINING WASTES

Metals

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Cobalt
Lead
Mercury
Nickel
Selenium
Vanadium

Volatiles

Benzene
Carbon Disulfide
Chlorobenzene
Chloroform
1,2-Dichloroethane
1,4-Dioxane
Ethyl benzene
Ethylene dibromide
Methyl ethyl ketone
Styrene
Toluene
Xylene

Semivolatile Base/Neutral Extractable Compounds

Anthracene
Benzo(a)anthracene
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Benzo(a)pyrene
Bis(2-ethyl hexyl)phthalate
Butyl benzyl phthalate
Chrysene
Dibenz(a,h)acridine
Dibenz(a,h)anthracene
Dichlorobenzenes
Diethyl phthalate
7,12-Dimethylbenz(a)anthracene
Dimethyl phthalate
Di-n-butyl phthalate
Di-n-octyl phthalate
Fluoranthene
Indene
Methyl chrysene
1-Methyl naphthalene
Naphthalene
Phenanthrene
Pyrene
Pyridine
Quinoline

Semivolatile Acid Extractable Compounds

Benzenethiol
Cresols
2,4-Dimethylphenol
2,4-Dinitrophenol
4-Nitrophenol
Phenol

TELEPHONE CONVERSATION LOG

NAME: George Pendygraft

DATE: 8/28/85

COMPANY: Rock Island (Lawyer)

PETITION #: 237

PHONE #: (317) 636-4535

RE:

Myles & I met with George to discuss Rock Island & another client, a multiple waste treater. We informed George of recent developments in our modelling efforts and how they relate to Rock Island. The refinery is in the process of collecting samples & will be submitting data in the near future, but may not meet the Nov. 15, 1985 deadline imposed by our last mass mailing

STATE OF INDIANA

STATE BOARD OF HEALTH

AN EQUAL OPPORTUNITY EMPLOYER

INDIANAPOLIS

Address Reply to:
Indiana State Board of Health
1330 West Michigan Street
P. O. Box 1964
Indianapolis, IN 46206-1964

August 26, 1985

Mr. William E. Laque
Environmental Coordinator
Rock Island Refinery Corporation
P.O. Box 68007
Indianapolis, IN 46268

Dear Mr. Laque:

Re: Rock Island Refining Corporation
Variance Request
U.S. EPA I.D. No. 006417430

Your request for a variance, dated July 26, 1985, in the form of a reduced level of liability coverage for sudden accidental occurrences has been referred to this Division's Technical Support Branch to determine if sufficient information has been provided so that the degree and duration of risk associated with your facility can be properly assessed by the Technical Secretary. Rule 320 IAC 4-7-26(c) provides that the Technical Secretary may require from the petitioning owner or operator such technical and engineering information as is deemed necessary to determine a level of financial responsibility other than that required by Rule 320 IAC 4-7-26(a).

In addition, any decision regarding the necessity of non-sudden liability coverage will depend upon a determination of your regulated status by the U.S. Environmental Protection Agency, based upon a review of your Part B application and petition for delisting.

Very truly yours,

David D. Lamm, Director
Division of Land Pollution Control

JWS/sk
cc: Ms. Sally K. Swanson, U.S. EPA, Region V

AUG 19 1985

Regulatory Status of "Informally Delisted" Wastes

David A. Stringham, Chief (5H-13)
Solid Waste Branch - Region V

John H. Skinner, Director (WH-562)
Office of Solid Waste

On March 11, 1982, a memorandum from James D. Bunting, Acting Deputy Associate Enforcement Counsel, was issued to Regional Notification Contacts on the subject of Hazardous Waste Delisting Petitions. This memorandum announced that the Waste Characterization Branch, OSW, had made a preliminary determination to grant delisting petitions for several facilities. Furthermore, the use of enforcement discretion for the wastes covered by these petitions was recommended until the delisting was finally published in the Federal Register. Rock Island Refining Corporation of Indianapolis, Indiana, was one of the petitioners covered by this "informal delisting." Specifically, slop oil emulsion solids (K049), heat excharger bundle cleaning sludge (K050), and API separator sludge (K051) from this facility were mentioned as meeting current delisting criteria, although for K049 and K051 wastes the delisting was stated to apply only in a land disposal scenario.

A letter similiar to this memorandum, dated June 10, 1982, was sent from John P. Lehman, Director of the Hazardous and Industrial Waste Division, to Peter Rasor of the Indiana State Board of Health (ISBH). Again, enforcement discretion was suggested, however, the stipulation made in Mr. Bunting's memorandum that the delisting for Rock Island's K049 and K051 wastes would only apply in a land disposal scenario was omitted from this letter. Mr. Lehman's correspondence also indicated that formal notification of exclusion from regulation for these wastes would appear in the Federal Register in the fall of 1982.

Yet another letter, from Todd Kimmell, Environmental Scientist of the Waste Characterization Branch, to William Lague, Rock Island's Environmental Coordinator, dated March 12, 1982, stated that Rock Island filter cake waste (which contains K049, K050, and K051) is considered non-hazardous and that a temporary exclusion would soon appear in the Federal Register.

The State of Indiana promptly acted on the information supplied by U.S. EPA headquarters, and granted a delisting variance on February 7, 1983 for Rock Island's wastes (K049, K050, K051). Because the land disposal scenario stipulation on the K049 and K051 wastes was not included in Mr. Lehman's letter to the state, the state variance does not contain that stipulation.

No formal delisting was ever published in the Federal Register. Headquarters requested additional information from Rock Island on January 6, 1984 with respect to their petition. On January 24, 1984, the State of Indiana informed Rock Island that their variance would continue until review of their petition is completed.

The preliminary letters sent by headquarters deeming Rock Island's waste to be non-hazardous are informal delistings. No statutory or regulatory basis exists for such delistings: pursuant to §§260.20(e) and 260.22(m), a final decision or temporary exclusion must be published in the Federal Register. Rock Island however, holds the opinion that U.S. EPA has granted a temporary exclusion for the facility's K049, K050, and K051 wastes (see attached Response to Notice of Deficiency (NOD)), June 28, 1985 and item I in the attached NOD itself). Region V is not currently contemplating enforcement action against Rock Island, however, the Region's policy is to continue the permit process regardless of pending delisting activities. Thus, Region V requests that headquarters clarify the status of Rock Island's wastes. It is of particular importance for this and other facilities to clearly understand what informal delistings mean not only for the purpose of permitting, but also due to the upcoming November 8, 1985 deadline date by which facilities must certify compliance with groundwater monitoring regulations. In fact, Rock Island has land disposed these wastes on site and has never properly closed its application areas because they hold that they are excluded from regulation.

When clarifying the status of these wastes, the Region also requests that the exact point in the waste stream at which delisting did, does, or may occur be made explicit. Also, an explanation of how disposal units containing informally delisted waste can show compliance should be addressed. All information herein requested should be uniformly supplied to the facility, the State, and the Region. Please respond to this request as soon as possible due to the upcoming November 8, 1985 deadline.

Attachments

cc: David Lamm, TSSH

bcc: Joe Boyle

SHS/Hogelius:vc 7/22/85 Disk #13

	TYPIST	AUTHOR	STU #1 CHIEF	STU #2 CHIEF	STU #3 CHIEF	T.S. CHIEF	WMB CHIEF	
INITIALS	VC	RAW	WC			RAW	DAS	
DATE	8/16/85	8/6/85	8/8/85			8/13/85	8/14/85	

8/9/85 8/14/85

FYI

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAR 06 1984

T-0237

Mr. William E. Laque
Coordinator of Environmental Affairs
Rock Island Refining Corporation
P. O. Box 68007
Indianapolis, Indiana 46268

RE: WIBBB0506

Dear Mr. Laque:

In January or February 1984, all petroleum refining facilities which had previously submitted petitions to EPA requesting the delisting of EPA Hazardous Waste Nos. K048, K049, K050, K051, and K052, received a letter and several attachments explaining the impending reauthorization of the Resource Conservation and Recovery Act (RCRA) and outlining additional testing and information likely to be required. This letter is to inform you that EPA, in conjuction with the American Petroleum Institute, has amended the list of organics originally distributed as Attachment A of the letter cited above. Enclosed is the new list of constituents that is to be addressed by petroleum refinery petitioners. Please note the following major changes. First, in addition to organics, the list now contains all of the EP metals cited in Table I 40 CFR 261.24 and also includes antimony, beryllium, cobalt, nickel, and vanadium. An analysis for the total metal content as well as an EP Test for Oily Waste (test procedure outlined in Attachment D of original letter) should be conducted on representative samples for each metal listed. Second, 52 new organic substances have been added to, and 30 substances have been deleted from the original list. Enclosed with the amended list is an itemization of substances not on the original list and substances taken off the original list. Please note that the requested analyses for the organics should be run on the waste itself to determine total content in the waste. No EP extractions are involved in these analyses.

I apologize for any inconvenience these changes in testing may have caused you or your facility. If you have any further questions regarding this information or any previous information sent to you regarding your delisting petition, please do not hesitate to call at (202) 382-4761.

Sincerely,

Barbara L. Bush

Barbara L. Bush
Environmental Toxicologist
Waste Identification Branch (WH-562)

298-23

RAFT

Constituents of Possible Interest to Refinery Listing Effort

Metals

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
* Cobalt
Lead
Mercury
Nickel
Selenium
Vanadium

Organics

Acetonitrile
Acrolein
Acrylonitrile
Aniline
Anthracene
Benz(c)acridine
Benz(a)anthracene
Benzene
Benzenethiol
Benzidine
Benzo(b)fluoranthene
Benzo(j)fluoranthene
Benzo(k)fluoranthene
Benzo(a)pyrene
Benzyl chloride
Bis(2-chloroethyl)ether
Bis(2-chloroisopropyl)ether
Bis(chloromethyl)ether
Bis(2-ethylhexyl)phthalate
Butyl benzyl phthalate
Carbon Disulfide
p-Chloro-m-cresol
Chlorobenzene
Chloroform
Chloromethane
2-Chloronapthalene
2-Chlorophenol
Chrysene
Cresol
Crotonaldehyde
Dibenz(a,h)acridine
Dibenz(a,j)acridine
Dibenz(a,h)anthracene
7H-Dibenzo(c,g)carbazole
7,12-Dimethylbenz(a)anthracene
Dibenzo(a,e)pyrene
Dibenzo(a,h)pyrene

Dibenzo(a,i)pyrene
Di-n-butylphthalate
1,1-Dichloroethane
Dichlorobenzenes
1,2-Dichloroethane
1,1-Dichloroethylene
1,2-Dichloroethylene
Dichloromethane
Dichloropropane
Dichloropropanol
Diethyl phthalate
2,4-Dimethylphenol
7,12-Dimethyl Benz(a)anthracene
Dimethylphthalate
4,6-Dinitro-o-cresol
2,4-Dinitrophenol
Dinitrotoluene
Di-n-octyl phthalate
1,4-Dioxane
1,2-Diphenylhydrazine
Ethyleneimine
Ethylene dibromide
Ethylene oxide
Fluoranthene
Hydrogen sulfide
* Hydroquinone
\+ Indene
Indeno(1,2,3-cd)pyrene
\+ Isophorone
2-Methyl Aziridine
\+ Methyl Benz(c)phenanthrene
Methyl mercaptan
3-Methylcholanthrene
\+ Methyl Chrysene
Methyl ethyl ketone
* 1-Methyl naphthalene
Naphthalene
Naphthylamine
\+ 5-Nitroacenapthene
p-Nitroaniline
Nitrobenzene
Nitrophenol
N-Nitrosodiethylamine
Pentachlorophenol
\+ Phenanthrene
Phenol
\+ Pyrene
Pyridine
\+ Quinoline
* Styrene
Tetrachloroethanes
Tetrachloroethylene
Toluene
Trichlorobenzenes

Trichloroethanes
Trichloroethylene
Trichlorophenols
\+ Trimethyl Benz(a)anthracene

*= constituents on the Michigan list
+= Not in Appendix VIII, but could appear at significant levels and require listing

STATE of INDIANA

ENVIRONMENTAL MANAGEMENT BOARD

INDIANAPOLIS 46206–1964

1330 West Michigan Street
P. O. Box 1964

Mr. William Laque
Rock Island Refining Corporation
5000 West 86th Street
P.O. Box 68007
Indianapolis, IN 46268

January 24, 1984

Dear Mr. Laque:

Re: Delisting of Hazardous Waste
in Indiana

The 1983 Indiana Legislature provided a procedure in the law for facilities to obtain a delisting for their hazardous waste in Indiana. This was not available previously and the Environmental Management Board granted variances for U.S. EPA delisted hazardous wastes.

This letter is to advise you of the procedure for obtaining Indiana delisting under the new law, IC 13-7-8.5-3(d).

1. Facilities which were granted delisting variances:

   The facilities listed in Appendix A, which were granted a delisting variance, are hereby granted delisting under IC 13-7-8.5-3(d). This delisting is valid for the wastes as described in the original petition only. Facilities which were granted delisting variances, but do not appear in Appendix A, will continue their variance until a review for a delisting is completed.

2. Facilities with delisting or variance requests pending:

   Petitions on file for a variance will be processed as a petition for delisting under IC 13-7-8.5-3(d). All pending petitions, whether for variances or delisting, will be processed on a first-in, first-out basis.

3. Facilities filing new delisting petitions:

   The same guidelines are in effect in Indiana as are used for the federal delisting. These guidelines can be found in 40 CFR 260.20 and 40 CFR 260.22.

When a proper review has been completed by staff, you will be informed, in writing, of the determination. Additional information may be requested from the petitioner(s) in writing at a later date.

298-18

Further information may be obtained in this matter by contacting Mr. Peter J. Rasor, Technical Support Branch, Division of Land Pollution Control, 1330 West Michigan Street, Indianapolis, Indiana 46206, AC 317/633-0764.

Very truly yours,

Ralph C. Pickard
Technical Secretary

PJR/tr
Enclosure
cc: Mr. Guinn Doyle
Mr. Dan Magoun
Mr. Jeff Stevens

APPENDIX A

FACILITY NAME & ADDRESS	EPA ID #	WASTE DESCRIPTION
Eli Lilly and Company Tippecanoe Laboratories P.O. Box 685 Lafayette, IN 47902	IND006050967	F002 F003 F005
International Minerals and Chemical Corp. P.O. Box 207 Terre Haute, IN 47808	IND040294621	F003
Windsor Plastics 601 N. Congress Avenue Evansville, IN 47715	IND007001050	F003

0237

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JAN 06 1984

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

Mr. William E. Laque
Coordinator of Environmental Affairs
Rock Island Refining Corporation
P.O. Box 68007
Indianapolis, Indiana 46268

RE: WIBBB0210

Dear Mr. Laque:

The purpose of this letter is to request additional data with respect to your delisting petition of March 11, 1982, for EPA Hazardous Waste Nos. K049, K050, and K051. The information we are requesting pertains to three specific matters: (1) presence of additional hazardous constituents; (2) additional testing for toxic metal mobility; and (3) acid digestion tests for landtreated wastes to investigate the possibility of releases via exposure pathways other than leaching. We are requesting this information, in part, to anticipate legislative changes to RCRA that would require the Agency to evaluate wastes for presence of hazardous constituents other than those for which a waste is listed, and would further require the Agency to make final determinations on pending temporary exclusions within a short time. (Failure by the Agency to act in that time would result in automatic cessation of the exclusion.) We also are concerned about the adequacy of the data supporting your petition. Obtaining this information now, therefore, is in the best interest of both petitioners and the Agency.

Therefore, petitioners are now being requested to address additional factors and hazardous constituents other than those for which the petitioned waste was initially listed. Our concern is limited, however, to those constituents for which there is a reasonable basis to believe that their presence in the waste may pose a significant potential threat to human health or the environment. The organic parameters which should be quantified for your waste are identified in Attachment A. This list is a combination of priority pollutants and other contaminants that are suspected of being present in petroleum refinery wastes. However, the list is considered tentative and if any constituents are found to be present that are not on this list, we may request further information. Therefore, you may wish to consider the other toxicants in Appendix VIII; any toxicant which you believe would not be in the waste should be identified along with an explanation for this contaminant. Furthermore, if there are other Appendix VIII constituents

that you have reason to believe may be present in your wastes, you should quantify these constituents. The list of toxicants is presently being used by the Agency's contractors in our ongoing petroleum refinery industry study to determine: (1) if additional toxicants should be included as constituents of concern for the presently listed petroleum refinery wastes (i.e., EPA Hazardous Waste Nos. K048, K049, K050, K051, and K052) and (2) if other wastes from the petroleum refinery industry should be listed as hazardous. The Agency will, if necessary, add constituents to this list if the industry study program identifies additional parameters not presently addressed.

Representative samples of Rock Island Refining's filter cake waste (minimum of four) should be collected and analyzed for total content of each of the EP toxic metals, total oil and grease, TOC, and the specific organic constituents identified in Attachment A. The recommended total oil and grease test is enclosed as Attachment C; TOC should be determined after step 9 of the EP Toxicity Test for Oily Waste (enclosed as Attachment D); and appropriate extraction and analytical methods for the parameters identified in Attachment A. As you may be aware, EPA is working with API to refine the analytical protocols for organics in oily wastes to insure adequate detection limits and expects to complete this effort by early 1984. We will forward these protocols to you as soon as they are developed. Please note that the requested analyses for the parameters in Attachment A should be run on the waste itself to determine total content in the waste. No EP extractions are involved in these analyses. If Rock Island Refining would rather initially run one or two composite sample through this organic characterization and meet with the Agency to discuss whether the levels of organics present in the waste are of regulatory concern before proceeding with complete representative analyses, please contact either Mr. Matthew Straus or myself at (202) 382-4770 to schedule an appropriate time.

In addition, we also are requiring that for those wastes which you request to be excluded, representative waste samples should be tested using the EP Toxicity Test for Oily Wastes. As you may be aware, a number of States and environmental groups have commented that the existing Extraction Procedure leachate test is not an appropriate test for oily-type wastes. In particular, they argued that the toxic metals in the waste may actually leach at higher concentrations than those predicted by the EP after the oily fraction of the waste degrades; they also argued that although oil may act as a solid in the EP test, in reality it will act as a liquid in a land disposal scenario, again underestimating the leaching potential of the toxic heavy metals. This draft test methodology has been developed to identify whether the oily fraction of the waste acts as a

liquid or a solid in a land disposal scenario. Moreover, this leachate test should also determine whether the oily fraction behaves as a binder, preventing the metals in the waste from entering the extract. This leach test has been developed with the assistance of the American Petroleum Institute (API) and should address the concerns that have been raised.

Finally, it is the Agency's tentative view that petitions for wastes that are to be landfarmed are to be evaluated based upon the total metal content in the waste. (This view applies for all wastes and not just petroleum refinery wastes). There are several reasons for this. First, leaching is not the sole exposure pathway for these wastes, as wind dispersion and surface runoff also can cause substantial harm. We also are concerned, as discussed above, that much of the binding organic fraction in the waste matrix will degrade rapidly in a landfarming scenario, leaving the toxic heavy metals available for release to the environment. The Agency, therefore, will evaluate the potential hazard of landfarmed waste by considering the total concentration of metals in the waste to be landfarmed. This data will be used in combination with the percent organic residual content remaining after degradation[1/] to determine whether the waste should be delisted.

Table I summarizes the additional data requested in today's letter. If you have any questions regarding today's action, the additional data requested above, or any of the test methodologies referenced above, please call me at (202) 382-4770.

Sincerely yours,

Myles E. Morse

Myles Morse
Environmental Protection Specialist
Waste Identification Branch

1/ The weight of the solid residuals remaining after step 9 of the EP Toxicity Test for the oily waste should also be determined.

Mr. William E. Laque
Environmental Coordinator
Rock Island Refining
P.O. Box 68007
Indianapolis, IN 46268

FEB 7 1983

Dear Mr. Laque:

Re: Variance for Delisted Hazardous Waste

Your facility's petition for a variance for delisted hazardous waste has been reviewed by staff. It is staff's recommendation that this variance be granted with certain provisions.

By the authority delegated to me by the Environmental Management Board on February 19, 1982, I am granting this variance for the waste materials as outlined in your petition subject to the following conditions:

1. The variance will be for a period of one (1) year per IC 13-7-7-6.

2. The waste material must go to a State permitted solid waste disposal facility.

3. Revocation of any temporary or final exclusion granted by the U.S. EPA will be sufficient grounds for immediate cancellation of this variance.

This variance is for the waste materials identified in your petition as K049-slop oil emulsion solids, K050-heat exchanger bundle cleaning sludges, K051-API separator sludge.

Contact Mr. George Oliver, Division of Land Pollution Control, for assistance in locating suitable disposal facility. Mr. Oliver may be reached at 317/633-0213 for further information.

Very truly yours,

Ralph C. Pickard
Technical Secretary

GPD/tw
cc: Mr. George Oliver
tw 4581m 1/31/83

Guinn
Hokolofsky
File in
RCRA Rock
Island

ROCK ISLAND REFINING
Corporation

January 25, 1983

JAN 26 2 29 PM '83
DIV. OF LAND POLLUTION CONTROL
STATE BOARD OF HEALTH

Mr. Guinn Doyle
Division of Land Pollution Control
Indiana State Board of Health
1330 W. Michigan Street
Indianapolis, Indiana 46206

Dear Mr. Doyle:

Attached is the letter from Northside Sanitary Landfill about which we spoke by phone yesterday.

Very truly yours,

W. E. Laque

William E. Laque
Coordinator of Environmental Affairs

WEL/mhj

Encl.

P.O. BOX 68007 • INDIANAPOLIS, INDIANA 46268 • (317) 872-3200

NORTHSIDE
SANITARY LANDFILL, INC.

January 21, 1983

Rock Island Refining Corporation
5000 West 86th Street
Indianapolis, Indiana 46268
Attention: Mr. W. E. Laque

Dear Mr. Laque:

Please be advised that the Northside Sanitary Landfill, Inc. has decided to stop the acceptance of RCRA hazardous waste for disposal as defined by the U.S. Environmental Protection Agency and the Indiana Environmental Management Board pursuant to 320 IAC 4-3-2. This decision has been made due to the fact that it could not be readily determined within a short period of time as to whether the run-off management at the active portion of the hazardous waste landfill meets the new design capacity expressed in new federal regulation 40 C.F.R. Section 265.302(b) effective January 26, 1983, as we discussed with you in our recent letter of January 10, 1983.

This voluntary suspension of the disposal of RCRA hazardous waste is effective as of January 25, 1983, and therefore, no such wastes will be accepted after Monday, January 24, 1983, and until you are further notified by this Company.

Our records indicate that your hazardous waste may be improperly classified as hazardous by the EMB and therefore, could be classified as non-hazardous in relationship to the federal standards, or could be rendered non-hazardous by appropriate treatment or solidification. In the event that your current waste is reclassified as non-hazardous or is rendered non-hazardous by treatment, Northside will then accept that waste and readjust the disposal charges accordingly.

If you have any questions, please contact me. I thank you for your previous use of our disposal facility.

Very truly yours,

J W Bankert

Jonathan W. Bankert
President

JWB:jjm

STATE APPROVED WASTE DISPOSAL FACILITY

985 South State Road 421, Zionsville, Indiana 46077-9791
(317) 769-4223

13

BAKER & DANIELS
810 FLETCHER TRUST BUILDING
INDIANAPOLIS, INDIANA 46204-2454
317-636-4535

WASHINGTON OFFICE
SUITE 600 1920 N STREET N.W.
WASHINGTON, D.C. 20036
202-785-1565

September 27, 1982

Mr. Dan Strahl
Land Application Group
Division of Water Pollution Control
Room 336
Indiana State Board of Health
1330 West Mighigan Street
Indianapolis, Indiana 46202

Re: Rock Island Land Application Facility

Dear Mr. Strahl:

On September 10, 1982, representatives of Rock Island Refining Corporation (Rock Island) met with you and Mr. Bruce Palin, Land Pollution Control Division, Indiana State Board of Health, to discuss the land application facility owned and operated by Rock Island at 5000 West 86th Street, Indianapolis, Indiana. During that meeting, Rock Island reported its intent to seek a permit from the Stream Pollution Control Board for its land application facility. Rock Island also sought guidance from the staff as to whether Rock Island could operate its land application facility pending consideration of that application by Water Pollution Control Division.

As we related at the meeting, Rock Island made application on September 9, 1980, with the Indiana Environmental Management Board for a provisional permit to land apply some of the wastes from its refining operation in Marion County, Indiana. The Technical Secretary to the Environmental Management Board issued to Rock Island a construction permit for its land application facility on November 18, 1980. Rock Island also sought interim status for this facility under regulations issued pursuant to the Resource Conservation and Recovery Act (RCRA), 42 U.S.C.

§§ 6901 et seq. (hereafter the RCRA regulations) because Rock Island originally intended to apply to this facility certain wastes, generated at its refinery, which were characterized as hazardous by the RCRA regulations. 40 C.F.R., Part 261. Rock Island filed the Part A application for interim status on November 18, 1980. 40 C.F.R. § 123.23.

Subsequently, Rock Island elected to proceed with the land application facility in two phases. In the first phase, Rock Island intended to apply to thirty acres of the facility materials taken from BS&W ponds located at the Refinery. These BS&W materials were not hazardous wastes for purposes of the federal RCRA regulations. See 40 C.F.R., Part 261, Subpart C. On January 20, 1981, the Technical Secretary modified Rock Island's construction permit for its land application facility, allowing application of the BS&W materials. The Technical Secretary issued an operating permit (No. 49-5) for that phase of the facility's operation on June 24, 1981.

In the second phase, Rock Island had intended to apply hazardous wastes on the remaining ten acres of the 40-acre land application facility. Rock Island later decided, based on a number of considerations, that it would not apply any RCRA designated hazardous wastes to any part of the land application facility. First, Rock Island was able to put into operation an existing vacuum filtration unit that achieved a significant reduction in the volume of hazardous waste, thereby making offsite disposal of such wastes economically reasonable. Second, Rock Island successfully petitioned EPA for a "delisting" of its wastes from the EPA hazardous waste list. (EPA notified Rock Island in March, 1982, that it had determined preliminarily to delist the Rock Island wastes. A copy of that notice is enclosed.) As a result, Rock Island has never applied to any part of its land application facility wastes characterized as hazardous by the RCRA regulations. 40 C.F.R., Part 261.

Because Rock Island has not and does not intend to apply hazardous wastes to its land application facility, this facility falls within the purview of the Stream Pollution Control Board regulations dealing with the application upon or incorporation into the soil of industrial wastewater, waste products and sludge. 330 IAC 3.3. In addition, it would seem unnecessarily burdensome on the State Board of Health staff for Rock Island to seek both a renewal of the operating permit (No. 49-5) and a permit pursuant to 330 IAC 3.3. For those reasons, Rock Island sought a clarification as to whether it could operate the land application facility if it only applied for a permit from the Stream

Pollution Control Board pursuant to 330 IAC 3.3. Based on discussions during the meeting of September 10, 1982, it is our understanding that both the Water Pollution Control Division and Land Pollution Control Division agree that Rock Island may proceed with its land application facility by complying with the Stream Pollution Control Board requirements for land application projects. 330 IAC 3.3.

We further understand Water Pollution Control Division's position to be that Rock Island's land application facility is an on-going land application operation, and, as such, may continue to operate if the application for the facility is filed on or before October 1, 1982. Rock Island will file timely such an application.

We appreciate your assistance in resolving these areas of concern to us. Please feel free to contact Mr. William E. Laque or the undersigned (317/636-4535) should you have questions or comments with respect to this matter.

Very truly yours,

BAKER & DANIELS

By _____
George W. Pendygraft

GWP/js

Enclosure

cc: Mr. Bruce Palin
Mr. William E. Laque

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460
OFFICE OF SOLID WASTE

MAR 12 1992

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

Mr. William E. Laque
Coordinator of Environmental Affairs
Rock Island Refining Corporation
P.O. Box 68007
Indianapolis, Indiana 46268

Dear Mr. Laque:

This letter confirms my telephone conversation with Mr. George W. Pendygraft of Baker and Daniels concerning the delisting petition filed by the Rock Island Refining Corporation. The Agency's Office of Solid Waste has completed a preliminary review of the petition and has indicated in the enclosed memorandum that the vacuum filter cake waste, listed for containing slop oil emulsion solids (K049), heat exchanger bundle cleaning sludges (K050), and API separator sludges (K051), is considered non-hazardous. This memorandum has been sent to the Regional Office of Enforcement. Any additional letters of confirmation may be obtained from Ms. Sally Swanson in the Regional Office. The temporary exclusion will appear in the Federal Register in the next few months.

Sincerely,

Todd A. Kimmell

Todd A. Kimmell, Environmental Scientist
Waste Characterization Branch
Hazardous and Industrial Waste Division (WH-565B)

Enclosure

cc:
Matt Straus (OSW)
George Pendygraft

8

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAR 11 1982

MEMORANDUM

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

SUBJECT: Hazardous Waste Delisting Petitions

FROM: James D. Bunting
Acting Deputy Associate Enforcement Counsel

TO: Regional Notification Contacts

The Waste Characterization Branch, OSW, has informed us that, pursuant to 40 CFR §260.20 and 22, OSW has made preliminary determinations to grant delisting petitions to the facilities listed in Attachment A. As you know, the Agency retains the authority to reverse these decisions if it receives additional information indicating that these wastes are hazardous under 40 CFR §261.11 or 40 CFR §261.30.

The determinations indicated will apply only to the Federal hazardous waste management system established under RCRA. States remain free to take any action they deem appropriate under their independent authority with regard to these wastes.

The authorized programs in some States include delisting provisions which, as indicated in the State's Memorandum of Agreement (MOA), require EPA review and concurrence as part of the State's delisting decisions. The Agency has reviewed the petitions from facilities in States within this category, and has indicated its concurrence by the determinations presented in Attachment A. In the list of petitioners in Attachment A, the States within this category are indicated by an asterisk (*).

Until the delisting is published in the Federal Register (the effective date of the delisting) we recommend the use of enforcement discretion, as discussed in Sarah Compton's memo of January 13, 1981, when dealing with these wastes at these facilities.

If there are any problems or questions about these actions please contact Myles Morse or William Sproat (Waste Characterization Branch, OSW (755-9187)).

Attachment

cc: M. Straus, OSW (WH-565B)
M. Morse, OSW (WH-565B)
W. Sproat, OSW (WH-565B)
T. Kimmel, OSW (WH-565B)
W. Miser, OSW (WH-565B)

Attachment A

Region	Facility Name	Hazardous Waste Exclusion	Location	ID No.
IV	*Intex Plastics Corporation	F005(a)	Corinth, MS	MSD096076781
V	Monsanto Chemical Intermediates Co.	K071(b)	Sauget, IL	ILD000802702
	Rock Island Refining Corporation	K049(c) K050(d) K051(c)	Indianapolis, IN	IND006417430
VII	Loxscreen Company Inc	F019(e)	Hayti, MO	MOD057758922
	Ramsey Corporation/ TRW Inc.	F006	Sullivan, MO	MOD094390416

(a) Temporary exclusion applies only to still bottom waste which has been "air-cured" for at least five days.

(b) Representative samples to be analyzed by EPA/EP prior to disposal; waste which exceeds an extract concentration of 25 times the National Interim Primary Drinking Water Standard will be retreated or handled as a hazardous waste.

(c) Temporary exclusion applies only in a land disposal scenario for this waste

(d) This waste is not considered hazardous when mixed with other non-hazardous wastewaters at the facility. (see amendment to the mixture rule FR November 17, 1981).

(e) Waste must be covered as a daily practice or each batch tested for total cyanide prior to disposal due to the Agency's concern about photoconversion If total cyanide in the waste exceeds 10ppm the waste must be covered as a daily practice. Photoconversion test data may be submitted to eliminate this condition.

Mr. William E. Laque
Environmental Coordinator
Rock Island Refining
P.O. Box 68007
Indianapolis, IN 46268

FEB 7 1983

Dear Mr. Laque:

Re: Variance for Delisted Hazardous Waste

Your facility's petition for a variance for delisted hazardous waste has been reviewed by staff. It is staff's recommendation that this variance be granted with certain provisions.

By the authority delegated to me by the Environmental Management Board on February 19, 1982, I am granting this variance for the waste materials as outlined in your petition subject to the following conditions:

1. The variance will be for a period of one (1) year per IC 13-7-7-6.

2. The waste material must go to a State permitted solid waste disposal facility.

3. Revocation of any temporary or final exclusion granted by the U.S. EPA will be sufficient grounds for immediate cancellation of this variance.

This variance is for the waste materials identified in your petition as K049-slop oil emulsion solids, K050-heat exchanger bundle cleaning sludges, K051-API separator sludge.

Contact Mr. George Oliver, Division of Land Pollution Control, for assistance in locating suitable disposal facility. Mr. Oliver may be reached at 317/633-0213 for further information.

Very truly yours,

Ralph C. Pickard
Technical Secretary

GPD/tw
cc: Mr. George Oliver
tw 4581m 1/31/83

Rock Island Refinery Corporation
Notice of Deficiency
IND 006417430

I. Before addressing the specific deficient or omitted items, it seems prudent to clarify the status of the Rock Island Refinery's wastes vis-a-vis the pertinent Federal Regulations. Those wastes appearing on Rock Island's original Part A are, and always have been, hazardous wastes. Although an informal delisting for three of Rock Island's listed wastes (K049, K050, and K051) was granted by the Office of Solid Waste in letters to Region V, Rock Island, and the Indiana State Board of Health dated respectively March 11, 1982; March 12, 1982; and June 10, 1982; a temporary delisting was never published in the Federal Register. Due to the fact that informal delistings have no statutory basis, these letters therefore have no force of law and in no way effect the regulation of these wastes. Consequently, the provisional variance granted by the Indiana State Board of Health for the slop oil emulsion solids (K049), heat exchanger bundle cleaning sludges (K050), and API separator sludge (K051) on February 7, 1983 was void upon issuance pursuant to that variance's condition #3 because no such federal exclusion ever existed. The U.S. EPA apologizes for any confusion caused by the informal delisting. It should be noted that in a phone conversation on March 20, 1985, Mr. Lange, Rock Island's environmental coordinator, stated to Mr. Woeclius of the regional staff that the corporation continues to treat these three wastes as hazardous wastes; such treatment is required unless and until a temporary or formal delisting is published in the Federal Register (see §§260.20(e) and 260.22(m)).

II. The Land Application Area indicated on the refinery's original Part A, dated November 18, 1980, also needs to be addressed. According to the information included in Form 3, Section III and Attachment A of the original Part A application, Rock Island's Land Application Area was in existence on November 19, 1980. Subsequent to that date, solids resulting from the treatment of listed hazardous wastes were land disposed; pursuant to §261.3(c) and (d) this is land application of hazardous waste and as such is subject to §265 until final disposition of the permit application is made. The permit itself will require compliance with the §264 regulations. If you are not seeking a permit for this unit, it must be closed in accordance with §265.

III. Wastewater produced from the vacuum filter also results from the treatment of a hazardous waste and again by §261.3(c) and (d) is itself a hazardous waste. This water becomes excluded from the RCRA permit regulations as it enters the sewage system; this effluent is then regulated under NPDES permit. However, between the vacuum filter and sewer the water is regulated as a hazardous waste and therefore the aeration lagoons are subject to all RCRA requirements for surface impoundments.

OEC
Delisting
Contact:
Steve Hirsch
352-7703

462-7347 RASOR

ROCK ISLAND REFINING Corporation

MAY 14 2 24 PM '82
DIV. OF LAND POLLUTION CONTROL
STATE BOARD OF HEALTH

872-3200

May 13, 1982

COPY

Mr. Peter J. Rasor
Technical Support Branch
Division of Land Pollution Control
1330 West Michigan Street
P.O. Box 1964
Indianapolis, Indiana 46206

Re: Rock Island Refining Corporation --
Petition for Variance Delisting
Hazardous Waste

Dear Mr. Rasor:

Rock Island Refining Corporation (Rock Island) owns and operates a petroleum refinery located at 5000 West 86th Street, Indianapolis, Indiana (Refinery). Three of the waste streams generated in the operations of the Refinery have been listed as hazardous in regulations adopted by the United States Environmental Protection Agency (EPA). 40 C.F.R. § 261.32. On October 16, 1981, Rock Island filed with the EPA Administrator its Petition for Regulatory Amendment to Exclude Hazardous Waste (Petition), seeking to "delist" these three listed hazardous waste streams, i.e., slop oil emulsion solids (K049), heat exchanger bundle cleaning sludge (K050), and API separator sludge (K051), including the vacuum filter cake waste mixture of these wastes. The information submitted to EPA in support of Rock Island's Petition is attached as Exhibit A.

Pursuant to the Petition filed by Rock Island, EPA recently determined from its preliminary review that these wastes are to be considered non-hazardous. Copies of the EPA letter dated March 12, 1982, and memorandum dated March 11, 1982, are attached as Exhibit B. EPA indicated that the temporary exclusion would appear in the Federal Register in the next few months.

Although these wastes, including the filter cake waste mixture, do not exhibit any Subpart C hazardous waste

characteristics, according to the testing, Rock Island has been required to manage these wastes as if they were hazardous because of the listings in the federal regulations (40 C.F.R. § 261.32) and the state regulations (320 IAC 4-3). Managing these wastes as hazardous wastes imposes an unnecessary operational and economic burden on Rock Island. For example, Rock Island incurs significant additional costs in disposing of the vacuum filter cake waste at a hazardous waste landfill rather than a sanitary landfill. These wastes also consume scarce disposal space at a hazardous waste landfill, and that space could be more beneficially reserved for wastes that exhibit Subpart C hazardous waste characteristics.

Rock Island, therefore, respectfully petitions the Board to grant a variance, pursuant to IC 13-7-7-6 and 320 IAC 4-3-6, delisting as hazardous wastes its slop oil emulsion solids (K049), heat exchanger bundle cleaning sludges (K050), API separator sludges (K051), and the resulting filter cake mixture of these wastes.

In the event you have questions or need of additional information, Rock Island will promptly respond to your request. Please telephone the undersigned at 872-3200.

Very truly yours,

William E. Laque

William E. Laque
Environmental Coordinator

cc: Mr. Ralph Pickard
Mr. David Lamm
Mr. Guinn Doyle
Mr. George Pendygraft

COPY

#237

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460
OFFICE OF SOLID WASTE

MAR 12 1982

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

Mr. William E. Laque
Coordinator of Environmental Affairs
Rock Island Refining Corporation
P.O. Box 68007
Indianapolis, Indiana 46268

Dear Mr. Laque:

This letter confirms my telephone conversation with Mr. George W. Pendygraft of Baker and Daniels concerning the delisting petition filed by the Rock Island Refining Corporation. The Agency's Office of Solid Waste has completed a preliminary review of the petition and has indicated in the enclosed memorandum that the vacuum filter cake waste, listed for containing slop oil emulsion solids (K049), heat exchanger bundle cleaning sludges (K050), and API separator sludges (K051), is considered non-hazardous. This memorandum has been sent to the Regional Office of Enforcement. Any additional letters of confirmation may be obtained from Ms. Sally Swanson in the Regional Office. The temporary exclusion will appear in the Federal Register in the next few months.

Sincerely,

Todd A. Kimmell

Todd A. Kimmell, Environmental Scientist
Waste Characterization Branch
Hazardous and Industrial Waste Division (WH-565B)

Enclosure

cc:
Matt Straus (OSW)
George Pendygraft

0237

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JAN 06 1984

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

Mr. William E. Laque
Coordinator of Environmental Affairs
Rock Island Refining Corporation
P.O. Box 68007
Indianapolis, Indiana 46268

RE: WIBBB0210

Dear Mr. Laque:

The purpose of this letter is to request additional data with respect to your delisting petition of March 11, 1982, for EPA Hazardous Waste Nos. K049, K050, and K051. The information we are requesting pertains to three specific matters: (1) presence of additional hazardous constituents; (2) additional testing for toxic metal mobility; and (3) acid digestion tests for landtreated wastes to investigate the possibility of releases via exposure pathways other than leaching. We are requesting this information, in part, to anticipate legislative changes to RCRA that would require the Agency to evaluate wastes for presence of hazardous constituents other than those for which a waste is listed, and would further require the Agency to make final determinations on pending temporary exclusions within a short time. (Failure by the Agency to act in that time would result in automatic cessation of the exclusion.) We also are concerned about the adequacy of the data supporting your petition. Obtaining this information now, therefore, is in the best interest of both petitioners and the Agency.

Therefore, petitioners are now being requested to address additional factors and hazardous constituents other than those for which the petitioned waste was initially listed. Our concern is limited, however, to those constituents for which there is a reasonable basis to believe that their presence in the waste may pose a significant potential threat to human health or the environment. The organic parameters which should be quantified for your waste are identified in Attachment A. This list is a combination of priority pollutants and other contaminants that are suspected of being present in petroleum refinery wastes. However, the list is considered tentative and if any constituents are found to be present that are not on this list, we may request further information. Therefore, you may wish to consider the other toxicants in Appendix VIII; any toxicant which you believe would not be in the waste should be identified along with an explanation for this contaminant. Furthermore, if there are other Appendix VIII constituents

298-6

that you have reason to believe may be present in your wastes, you should quantify these constituents. The list of toxicants is presently being used by the Agency's contractors in our ongoing petroleum refinery industry study to determine: (1) if additional toxicants should be included as constituents of concern for the presently listed petroleum refinery wastes (i.e., EPA Hazardous Waste Nos. K048, K049, K050, K051, and K052) and (2) if other wastes from the petroleum refinery industry should be listed as hazardous. The Agency will, if necessary, add constituents to this list if the industry study program identifies additional parameters not presently addressed.

Representative samples of Rock Island Refining's filter cake waste (minimum of four) should be collected and analyzed for total content of each of the EP toxic metals, total oil and grease, TOC, and the specific organic constituents identified in Attachment A. The recommended total oil and grease test is enclosed as Attachment C; TOC should be determined after step 9 of the EP Toxicity Test for Oily Waste (enclosed as Attachment D); and appropriate extraction and analytical methods for the parameters identified in Attachment A. As you may be aware, EPA is working with API to refine the analytical protocols for organics in oily wastes to insure adequate detection limits and expects to complete this effort by early 1984. We will forward these protocols to you as soon as they are developed. Please note that the requested analyses for the parameters in Attachment A should be run on the waste itself to determine total content in the waste. No EP extractions are involved in these analyses. If Rock Island Refining would rather initially run one or two composite sample through this organic characterization and meet with the Agency to discuss whether the levels of organics present in the waste are of regulatory concern before proceeding with complete representative analyses, please contact either Mr. Matthew Straus or myself at (202) 382-4770 to schedule an appropriate time.

In addition, we also are requiring that for those wastes which you request to be excluded, representative waste samples should be tested using the EP Toxicity Test for Oily Wastes. As you may be aware, a number of States and environmental groups have commented that the existing Extraction Procedure leachate test is not an appropriate test for oily-type wastes. In particular, they argued that the toxic metals in the waste may actually leach at higher concentrations than those predicted by the EP after the oily fraction of the waste degrades; they also argued that although oil may act as a solid in the EP test, in reality it will act as a liquid in a land disposal scenario, again underestimating the leaching potential of the toxic heavy metals. This draft test methodology has been developed to identify whether the oily fraction of the waste acts as a

liquid or a solid in a land disposal scenario. Moreover, this leachate test should also determine whether the oily fraction behaves as a binder, preventing the metals in the waste from entering the extract. This leach test has been developed with the assistance of the American Petroleum Institute (API) and should address the concerns that have been raised.

Finally, it is the Agency's tentative view that petitions for wastes that are to be landfarmed are to be evaluated based upon the total metal content in the waste. (This view applies for all wastes and not just petroleum refinery wastes). There are several reasons for this. First, leaching is not the sole exposure pathway for these wastes, as wind dispersion and surface runoff also can cause substantial harm. We also are concerned, as discussed above, that much of the binding organic fraction in the waste matrix will degrade rapidly in a landfarming scenario, leaving the toxic heavy metals available for release to the environment. The Agency, therefore, will evaluate the potential hazard of landfarmed waste by considering the total concentration of metals in the waste to be landfarmed. This data will be used in combination with the percent organic residual content remaining after degradation[1/] to determine whether the waste should be delisted.

Table I summarizes the additional data requested in today's letter. If you have any questions regarding today's action, the additional data requested above, or any of the test methodologies referenced above, please call me at (202) 382-4770.

Sincerely yours,

Myles E. Morse

Myles Morse
Environmental Protection Specialist
Waste Identification Branch

1/ The weight of the solid residuals remaining after step 9 of the EP Toxicity Test for the oily waste should also be determined.

Rock Island Refinery #C237

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAR 11 1982

MEMORANDUM

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

SUBJECT: Hazardous Waste Delisting Petitions

FROM: James D. Bunting
Acting Deputy Associate Enforcement Counsel

TO: Regional Notification Contacts

The Waste Characterization Branch, OSW, has informed us that, pursuant to 40 CFR §260.20 and 22, OSW has made preliminary determinations to grant delisting petitions to the facilities listed in Attachment A. As you know, the Agency retains the authority to reverse these decisions if it receives additional information indicating that these wastes are hazardous under 40 CFR §261.11 or 40 CFR §261.30.

The determinations indicated will apply only to the Federal hazardous waste management system established under RCRA. States remain free to take any action they deem appropriate under their independent authority with regard to these wastes.

The authorized programs in some States include delisting provisions which, as indicated in the State's Memorandum of Agreement (MOA), require EPA review and concurrence as part of the State's delisting decisions. The Agency has reviewed the petitions from facilities in States within this category, and has indicated its concurrence by the determinations presented in Attachment A. In the list of petitioners in Attachment A, the States within this category are indicated by an asterisk (*).

Until the delisting is published in the Federal Register (the effective date of the delisting) we recommend the use of enforcement discretion, as discussed in Sarah Compton's memo of January 13, 1981, when dealing with these wastes at these facilities.

If there are any problems or questions about these actions please contact Myles Morse or William Sproat (Waste Characterization Branch, OSW (755-9187)).

Attachment

cc: M. Straus, OSW (WH-565B)
M. Morse, OSW (WH-565B)
W. Sproat, OSW (WH-565B)
T. Kimmel, OSW (WH-565B)
W. Miser, OSW (WH-565B)

Attachment A

Region	Facility Name	Hazardous Waste Exclusion	Location	ID No.
IV	*Intex Plastics Corporation	F005(a)	Corinth, MS	MSD096076781
V	Monsanto Chemical Intermediates Co.	K071(b)	Sauget, IL	ILD000802702
#0237	Rock Island Refining Corporation	K049(c) K050(d) K051(c)	Indianapolis, IN	IND006417430
VII	Loxscreen Company Inc	F019(e)	Hayti, MO	MOD057758922
	Ramsey Corporation/ TRW Inc.	F006	Sullivan, MO	MOD094390416

(a) Temporary exclusion applies only to still bottom waste which has been "air-cured" for at least five days.

(b) Representative samples to be analyzed by EPA/EP prior to disposal; waste which exceeds an extract concentration of 25 times the National Interim Primary Drinking Water Standard will be retreated or handled as a hazardo waste.

(c) Temporary exclusion applies only in a land disposal scenario for this wast

(d) This waste is not considered hazardous when mixed with other non-hazardous wastewaters at the facility. (see amendment to the mixture rule FR Novembe 17, 1981).

(e) Waste must be covered as a daily practice or each batch tested for total cyanide prior to disposal due to the Agency's concern about photoconversi If total cyanide in the waste exceeds 10ppm the waste must be covered as daily practice. Photoconversion test data may be submitted to eliminate this condition.

file

STATE OF INDIANA

INDIANAPOLIS

STATE BOARD OF HEALTH

AN EQUAL OPPORTUNITY EMPLOYER

Address Reply to:
Indiana State Board of Health
1330 West Michigan Street
P. O. Box 1964
Indianapolis, IN 46206

December 29, 1981

William Laque, Environmental Coordinator
Rock Island Refining Corp.
5000 W. 86th Street
P. O. Box 68007
Indianapolis, IN 46268

Dear Mr. Laque:

Re: Delisting Petition

The Division of Land Pollution Control has noted that the Rock Island Refining Corporation facility in Indianapolis, Indiana has applied for a temporary exclusion for their hazardous waste by the United States Environmental Protection Agency. The waste material will still be recognized as a hazardous waste in Indiana and as such must still meet the appropriate disposal requirements.

Pursuant to 320 IAC 4-3-6, Variance for Delisted Hazardous Waste, it will be necessary to petition the Indiana Environmental Management Board for a variance before disposal as other than a hazardous waste.

A summary of the test data and other information sent to the U.S. EPA for consideration of delisting as a hazardous waste should also be sent to the State of Indiana for evaluation. After proper evaluation and granting of your exclusion by the U.S. EPA, your petition will be presented to the Board with staff recommendation at the next available meeting.

Please address all correspondence in this matter to Mr. Peter J. Rasor, Technical Support Branch, Division of Land Pollution Control, AC 317/633-0764.

Very truly yours,

Guinn Doyle

Guinn Doyle, Chief
Hazardous Waste Management Branch
Division of Land Pollution Control

PJR/cm
cc: L. Langlotz

ROCK ISLAND REFINING
Corporation

Rec. 12/23/81

December 14, 1981

Mr. Todd A. Kimmell
Environmental Scientist
Waste Characterization Branch
Hazardous and Industrial Waste
Division (WH-565)
United States Environmental
Protection Agency
Washington, DC 20460

Re: Information Supplementing the Petition of Rock Island Refining Corporation for Regulatory Amendment to Exclude Hazardous Waste

Dear Mr. Kimmell:

On October 16, 1981, Rock Island Refining Corporation filed with the Administrator of the United States Environmental Protection Agency (EPA) its Petition for Regulatory Amendment to Exclude Hazardous Waste (Petition). The additional information requested by letter of November 18, 1981, is set forth in the enclosed Appendix A.

If additional questions or the need for other information should arise, please contact the writer or Dr. George Pendygraft of Baker & Daniels at 317/636-4535.

Very truly yours,

William E. Laque

William E. Laque
Coordinator of Environmental
Affairs

WEL/mhj
Enclosure
cc: George W. Pendygraft, Ph.D.

November 18, 1981

Bill Laque
Rock Island Refining
5000 W. 86th St.
Indianapolis, Indiana 46268

Dear Bill,

All analyses performed by EMS Laboratories, Inc., for Rock Island conforms to 40 CFR 136.

Analytical accuracy is determined by analyzing standards obtained from EPA or commercial reference sample services on a daily basis whenever possible. Recoveries of these standards must be 100 $\pm$ 15% for most analyses or no analyses will be performed. If the recovery is not 100 $\pm$ 10%, analyses will be performed, but the method goes through a trouble shooting procedure.

Accuracy is also measured using spiked samples, particularly when troublesome samples are encountered. Recoveries of spikes generally must be 80% after correcting for the "unspiked" concentration. All samples analyzed by graphite furnace atomic absorption are spiked to insure and recoveries. If poor recovery of spike is observed, quantification by standard additions is mandatory.

After each set of analyses, a confirmation standard is run and recovery must be 100 $\pm$ 15% or data is rejected.

Precision is measured by applying the following criterion:

Where duplicate measurements A and B have been made on different aliquots of the same sample

$$\frac{2\ (A-B)}{A+B} \leq .15$$

if both A and B are $\geq$ 20 times the reportable detection limit. If this criterion is met, the analyses performed in that particular run are deemed acceptable.

Very truly yours,

C. Steven Gohmann, President
EMS LABORATORIES, INC.

CSG/jiw

Figure 2

October 19, 1981

To Whom It May Concern:

Enclosed is our quality assurance information which you have requested. We have included accuracy data consisting of average percent recovery plus or minus the standard deviation. Precision quality assurance data is not included, but the acceptance criterion which we follow for samples whose analytical values are greater than fifteen times the detection limit of any particular determination is the following:

> Where duplicate analytical determinations have been made on the same sample, and values A and B have been determined.

$$\frac{2\ (A-B)}{A+B} \leq .15$$

Special explanation should be included for BOD data for July and August since during these two months we were training two new laboratory technicians. We have included data generated by these new technicians in our QA record.

Should you have any questions concerning this matter, please contact me directly.

Sincerely,

C. Steven Gohmann, President
EMS LABORATORIES, INC.

CSG/jiw

Enclosure

Figure 3

QUARTLEY QUALITY ASSURANCE

FOR JULY, AUGUST, SEPTEMBER 1981

PARAMETER	AVERAGE % RECOVERY	STANDARD DEVIATION	WORKING CONCENTRATION RANGE (mg/1)
CYANIDE			
July	99 %	± 5 %	0.10-1.0
Aug	96 %	± 3 %	
Sept.	98 %	± 6 %	
PHENOL			
July	97 %	± 11 %	0.10-1.0
Aug.	97 %	± 6 %	
Sept.	91 %	± 10 %	
OIL & GREASE			
July	93 %	± 4 %	71-95 mg
Aug.	94 %	± 2 %	
Sept.	96 %	± 4 %	
BOD			
July	109 %	± 24 %	High Standard 200
Aug.	133 %	± 24 %	Low Standard 20
Sept.	96 %	± 12 %	
TOTAL SUSPENDED SOLIDS			
July	0.02 %		Replicate Data
Aug.	0.04 %		Base on
Sept.	0.02 %		$\frac{2\ (A-B)}{(A+B)} \leq .15$
CADMIUM			
July	100 %	± 4 %	0.10-0.99
Aug.	106 %	± 4 %	
Sept.	98 %	± 4 %	
NICKEL			
July	102 %	± 3 %	0.10-0.99
Aug.	109 %	± 6 %	
Sept.	103 %	± 6 %	
COPPER			
July	106 %	± 6 %	0.10-0.99
Aug.	95 %	± 5 %	
Sept.	98 %	± 6 %	
ZINC			
July	100 %	± 2 %	1.0-4.0
Aug.	100 %	± 5 %	
Sept.	99 %	± 4 %	

Figure 3

LEAD			
July	103 %	± 6 %	0.10-1.0
Aug.	100 %	± 0 %	
Sept.	97 %	± 5 %	
CHROMIUM (total)			
July	99 %	± 6 %	0.10-.99
Aug.	92 %	± 5 %	
Sept.	92 %	± 5 %	
CHROMIUM VI			
July	101 %	± 5 %	0.05-0.50
Aug.	99 %	± 5 %	
Sept.	98 %	± 5 %	

Figure 3

APPENDIX A

EPA REQUESTED ADDITIONAL
INFORMATION

1. Request Number 1. "In addition to the description of the waste treatment system that was supplied in the petition, we will also need a schematic diagram of the waste treatment system showing all points of treatment and sampling points." OK

   Information. A schematic diagram of the waste treatment system is presented in the attached Figure 1. All samples were taken from the cake waste exiting from the vacuum filter shown in Figure 1.

2. Request Number 2. "What was the disposal scenario for the sludge prior to November 19, 1980, (the date RCRA went into effect), between November 19, 1980 and the present, and also the proposed future disposal scenario assuming the petition will be granted. Be specific."

   Information. Prior to November 19, 1980, Rock Island, pursuant to State of Indiana approval, disposed of oily sludge at Northside Sanitary Landfill, Boone County, Indiana. Some components of the filter cake waste, such as slop oil emulsion solids, could have been disposed of in two basic sediment and wastewater ponds at the refinery prior to 1980. However, all use of these ponds ceased prior to 1980. Rock Island presently disposes of the filter cake waste at Northside Sanitary Landfill, Boone County, Indiana, in compliance with applicable federal, state and local requirements. Rock Island understands that Northside Sanitary Landfill (EPA ID No. IND 079579876) has interim status under the RCRA and regulations issued pursuant thereto. If the Petition is granted, Rock Island proposes to dispose of its filter cake waste at a state approved landfill. OK

3. Request Number 3. "Go into more detail with respect to the methods and equipment that were used to obtain representative samples of the waste for analysis."

   Information. As noted in 40 C.F.R., Part 261, Appendix I, "(t)he methods and equipment used for sampling waste materials will vary with the form and consistency of the waste material to be sampled." The filter cake waste can be considered as an uniformly homogeneous mixture of granular or powdered material. The protocol for representative sampling of the filter cake is presented in Section 3.2-19 of "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods," SW-846, U.S. Environmental Protection Agency, Office of Solid Waste, Washington, D.C. (1980). In this instance, a shovel OK

was used to obtain representative samples, proper care being taken to ensure that samples were selected from several locations in the container receiving the filter cake waste. The homogeneity of the filter cake waste is attributable to the frequent admixing of the pre-filtered slurry. For example, admixing of the waste occurs in the API separators, the sludge holding tanks and the vacuum filter reservoir.

4. Request Number 4. "All EP's should be conducted using the Method of Standard Additions. Spike concentration and percent recovery should be reported. Normal quality control analyses, spiked water samples, are acceptable as long as there are no interferences present in the sample matrix. If this is the case, a statement to this effect will be necessary. The Method of Standard Additions may be found in SW-846: Test Methods for Evaluating Solid Waste; Physical Chemical Methods."

   Information. The accuracy of the analytical tests were monitored by using spiked samples and determining percent recovery of reference samples. Those data are discussed in a letter from EMS Laboratories, Inc., attached as Figure 2. Quality assurance data are presented in the attached Figure 3. If recoveries of spiked water samples indicated interferences were present, then quantification of species concentration was by the methods of standard addition (see Figure 2).

5. Request Number 5. "As we had discussed during our conversation, the statement made on page 5 is wrong. K050 wastes are not 'exempt from the EPA regulations because they do not exit the facilities in which they are generated.' I believe what you are referring to here is an exemption under §261.4 (c), (see 12/4/80 FR 80286) for hazardous waste which is generated '...in a manufacturing unit...' This exemption only applies until that waste exits the unit in which it was generated. My only concern here is that the samples of the waste, to be representative, must contain proportionate amounts of all three of the listed wastes, including waste K050. If this is not the case, we will need to see additional data on representative samples of the waste."

   Information. Rock Island amends page 5, line 13 of its Petition by striking the word "facilities" and substituting therefor the word "units." At page 5 of its Petition, Rock Island observed that "the K050 hazardous wastes are infrequently removed from the heat exchanger bundles, typically done only during a shutdown for plant-wide maintenance." Virtually all of the 150 or so heat exchanger bundles at the refinery are cleaned during plant-wide shutdown.*/ The purpose

---

*/It obviously would impose a severe restriction if petitioners were required to obtain data representative of materials generated during infrequent plant shutdowns, possibly occurring once every two years or so. We do not interpret Request Number 5 to be seeking such data.

of the discussion at pages 5 and 6 of the Petition was to show that the heat exchanger bundle sludges generated during shutdown would not affect in any significant way the levels of lead and chromium in the filter cake wastes. Rock Island cleans heat exchanger bundles as routine maintenance requires, and over the period of time in which the sampling was performed, several heat exchanger bundles were cleaned. Thus, the filter cake waste samples in Table 2 of the Petition are representative of the expected proportionate amounts of K049, K050 and K051 wastes.

6. Request Number 6. "Four samples of the sludge were taken and analyzed. All four of these samples differ considerably with respect to all of the reported parameters. For example, % total solids ranged from --% to 59%. Why is there such a great difference here? This is important, as I have said before, the samples should be representative."

Information. The worst case situation, viz., the potential leaching of lead and chromium from filter cake waste improperly managed, was evaluated when Rock Island subjected representative samples of the filter cake waste to the EP test. The test results presented in Table 2 of the Petition are independent of the percent total solids in the samples. Prior to the March 25, 1980, sampling, various different mesh filter media (50, 60 and 80 mesh diatomaceous earth from Eagle Pitcher, Inc., Cincinnati, Ohio) were used in the vacuum filter. In order to evaluate optimum filtration, total solids analyses were performed on three demonstration samples as reported in Table 1 of the Petition. No total solids evaluation was performed on the April 1, 1980, filter cake because it was judged to be dry. The "as received" results in Table 1 were merely submitted to EPA as background information. These tests demonstrated nonetheless that the vacuum filter has performed well. Because of the complexity of the refinery's manufacturing processes, the variability in Table 1 is not at all unexpected.

Indeed, these samples were purposely taken over a period of time sufficient to reflect any variability in the refinery's operations. With respect to the demonstration data in Table 2, regardless of the gross chemical characteristics of the filter cake waste, the EP test parameters are well under the maximum allowable parameters.

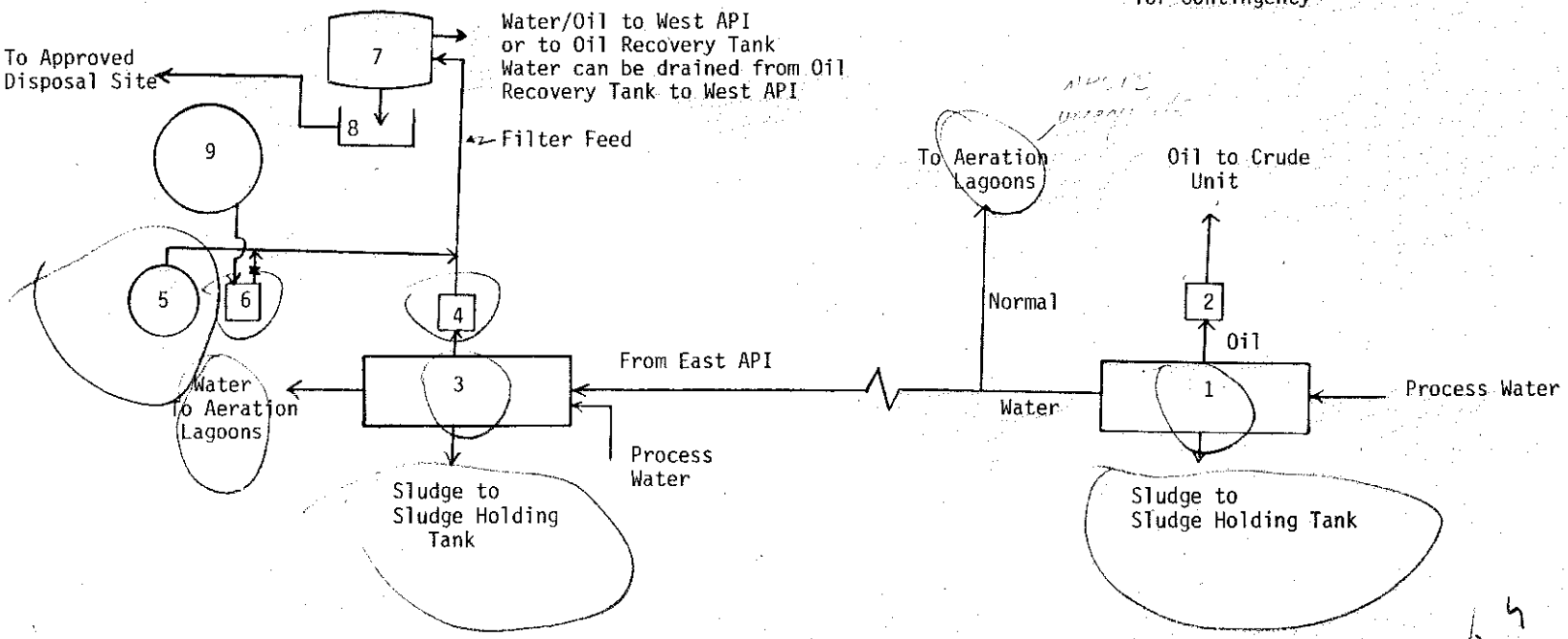
Figure 1

Schematic Diagram of

ROCK ISLAND

WASTE TREATMENT SYSTEM

1. East Process Water API Separator
2. East API Oil Recovery Pit
3. West Process Water API Separator
4. West API Oil Recovery Pit
5. Sludge Holding Tank (East and West API Sludge to be Filtered)
6. Sludge Pump Suction Pit
7. Oliver Vacuum Filter
8. Filter Cake Receiving Bin
9. Clarifier (Out of Service) can be used for Contingency



BAKER & DANIELS
810 FLETCHER TRUST BUILDING
INDIANAPOLIS, INDIANA 46204-2454
317-636-4535

WASHINGTON OFFICE
SUITE 600 1920 N STREET N.W.
WASHINGTON, D.C. 20036
202-785-1563

October 16, 1981

Mr. Myles Morse
Environmental Protection
Specialist
401 M Street S.W.
Room 2108
Washington, D.C. 20460

Dear Mr. Morse:

Enclosed is a copy of a Petition for Regulatory Amendment to Exclude Hazardous Waste and supporting Statement of Need and Justification for Exclusion which we are filing on behalf of Rock Island Refining Corporation. If you have any questions regarding this Petition, please feel free to call me.

Very truly yours,

George W. Pendygraft

George W. Pendygraft

GWP/am
Enclosures

cc: William E. Laque

#0237

BEFORE THE UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

In the Matter of the Petition of Rock Island Refining Corporation Proposing the Amendment of Subpart D of Part 261 of Title 40 of the Code of Federal Regulations	))))))	No. _____

PETITION FOR REGULATORY AMENDMENT
TO EXCLUDE HAZARDOUS WASTE

Rock Island Refining Corporation (Rock Island) files this Petition with the Administrator of the United States Environmental Protection Agency pursuant to Section 7004 of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. § 6974, and regulations promulgated pursuant thereto, 40 C.F.R. §§ 260.20 and 260.22. Rock Island states the following in support of the Petition.

1. Rock Island is an Indiana corporation with its principal place of business at 5000 West 86th Street, Indianapolis, Indiana 46268.

2. Rock Island owns and operates a petroleum refinery (Refinery) which generates wastes listed as hazardous in Subpart D of Part 261 of Title 40 of the Code of Federal Regulations. The disposal of those wastes in accordance with regulatory requirements that appear applicable, 40 C.F.R., Parts 262-265, imposes significant, continuing costs on the operation of the Refinery.

3. Rock Island requests the Administrator to issue a regulatory amendment to exclude temporarily and permanently from 40 C.F.R. § 261.32 the mixtures of solid wastes generated at the Refinery and designated as KO49, KO50 and KO51 in Subpart D.

4. In its Statement of Need and Justification for Exclusion, concurrently filed herewith, Rock Island sets forth more fully the tests, studies and other information in support of this Petition.

Respectfully submitted,

ROCK ISLAND REFINING CORPORATION

By William E. Laque
William E. Laque
Coordinator of Environmental Affairs

P.O. Box 68007
Indianapolis, IN 46268
317/872-3200

BAKER & DANIELS

By Joseph B. Carney
Joseph B. Carney

George W. Pendygraft

810 Fletcher Trust Bldg.
Indianapolis, IN 46204
317/636-4535

Attorneys for Rock Island Refining Corporation

BEFORE THE UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

In the Matter of the Petition of Rock Island Refining Corporation Proposing the Amendment of Subpart D of Part 261 of Title 40 of the Code of Federal Regulations	)	No. _____

STATEMENT OF NEED AND
JUSTIFICATION FOR EXCLUSION

Background facts. Rock Island Refining Corporation (Rock Island) owns and operates a petroleum refinery (the Refinery) at 5000 West 86th Street, Indianapolis, Indiana 46268. The Refinery generates a variety of solid wastes but only the following of its wastes have been described by the United States Environmental Protection Agency (EPA) in its regulations (40 C.F.R. § 261.32) as hazardous: slop oil emulsion solids (K049), heat exchanger bundle cleaning sludges (K050), API separator sludges (K051), and leaded tank bottom sludges (K052).

It is the intention of Rock Island to dispose of the small quantities of K052, leaded tank bottom sludges, at the time of removal from the tank, which is an infrequent occurrence, in full compliance with the regulations applicable to the disposal of hazardous wastes. On the other hand, the K049, K050 and K051 wastes generated at the Refinery create a disposal problem because of their quantities and costs of

K050 heat exchanger bundle cleaning sludge.
K051 API sep. sludge.
K049 slop oil emulsion solids.

removal. These wastes are collected and subsequently treated by means of a vacuum filter facility which reduces their volume and produces a relatively dry cake of solids (filter cake waste). Despite the mixing and treatment, Rock Island recognizes that the filter cake waste continues to be hazardous because it contains one or more hazardous wastes listed in Subpart D of Part 261 of Title 40 of the Code of Federal Regulations. As a result Rock Island is compelled to consider the filter cake as a hazardous waste with the resulting excessive expenses in its disposal. By its Petition Rock Island seeks to have its filter cake waste excluded from such classification.

Basis for excluding the filter cake waste as a hazardous waste. The KO49, KO50, and KO51 designated wastes are listed as Subpart D hazardous wastes because of the levels of lead and chromium generally found in those wastes. 40 C.F.R. § 261.32; 40 C.F.R., Part 261, Appendix VII. Despite the mixing and treatment, the filter cake waste may continue to be considered as a Subpart D hazardous waste because of the presumed presence of lead and chromium. For this reason Rock Island has caused samples of its filter cake waste to be analyzed, and the results of analyses for lead and chromium are presented in the attached Table 1. In view of the detection of some levels of lead and chromium, Rock Island has caused representative samples of its filter cake waste to be subjected to the EPA extraction procedure toxicity test (EP

test). 40 C.F.R., Part 261, Appendix II. Those results are presented in the attached Table 2. In the following material Rock Island will demonstrate that its filter cake waste, taken as a whole, does not meet the hazardous criterion of 40 C.F.R. § 261.11(a)(3) and thus should be excluded specifically from the lists of Subpart D hazardous wastes.[1/] 40 C.F.R. § 260.22(d)(2).

Sampling and testing. All sampling and testing of the filter cake waste were performed by EMS Laboratories, Inc., Two Environmental Plaza, 7901 West Morris Street, Indianapolis, Indiana 46231. The names and qualifications of the persons sampling and testing the filter cake waste are set forth in Appendix A. The sampling (testing) dates are March 2, 1981 (March 20, 1981); March 25, 1981 (April 17, 1981); April 1, 1981 (April 27, 1981); and April 10, 1981 (April 30, 1981).

Description of the manufacturing process. Rock Island produces gasoline, kerosene (range oil or #1 fuel oil), distillate fuel oils, residual fuel oils, and other products from crude petroleum and its fractionation products through straight distillation of crude oil, redistillation

---

[1/] Interestingly, the lead and chromium levels in the filter cake waste do not appear to be dissimilar from the levels of those constituents that might be found in other solid wastes, such as sludges generated at municipal sewage treatment plants, which are not listed as hazardous wastes. Other sludges containing levels of lead and chromium that are comparable or in excess of those levels in the filter cake waste have been excluded from the lists of Subpart D hazardous wastes. See e.g., 46 Fed. Reg. 40154, et seq. (August 6, 1981).

of unfinished petroleum derivatives, cracking or other processes.

The presence of chromium in the solid wastes generated at the Refinery results from the use of chromate as a corrosion inhibitor in the Refinery's cooling tower water. Although the addition of chromate to the cooling water is strictly controlled, low levels of chromium do appear in the filter cake waste generated at the Refinery. However, the Refinery's cooling tower blowdown water is exposed to high temperatures and alkaline conditions which virtually assure reduction of any chromium VI to chromium III.[2/] Indeed, using the EP test, no detectable levels of chromium VI were extracted from the filter cake waste (see Table 2).

The source of lead in the filter cake waste is the gasoline octane booster, tetraethyl lead. Along with condensed water, some "leaded gasoline" is drawn off from the gasoline storage tanks at the Refinery. This water and leaded gasoline is then passed into the Refinery's slop oil

---

[2/] EPA has proposed to amend the characteristic of Extraction Procedure (EP) toxicity, 40 C.F.R. § 261.24, to apply to chromium VI instead of total chromium. 45 Fed. Reg. 72029 (October 30, 1980). EPA has observed that "[i]t is generally agreed among the scientific community that the available data show that trivalent chromium is less toxic than the hexavalent form." Ibid. Indeed, EPA has concluded: "If the concentraton of hexavalent chromium is relatively low, the Agency has decided to consider the concentration of hexavalent chromium rather than total chromium in making a [delisting] decision." 46 Fed. Reg. 40161, fn. 16 (August 6, 1981).

recovery system and, after treatment in an API separator, eventually is discharged as a component of the filter cake waste. The continuing reduction in the use of tetraethyl lead at the Refinery over historical use should result in further lowering of the lead levels in the filter cake waste. Furthermore, Rock Island intends to employ a system to recover gasoline from its wastewater and that system will substantially reduce, if not eliminate, this source of lead in the filter cake waste.

Presently, the solid wastes generated at the Refinery which are designated as KO50, heat exchanger bundle sludge, hazardous wastes are exempt from the EPA regulations because they do not exit the facilities in which they are generated. 40 C.F.R. § 261.4(c); 45 Fed. Reg. 72024, 72028 (Oct. 30, 1980). The eventual removal of these wastes, however, will not result in the production of a waste not covered by this demonstration. The KO50 hazardous wastes are infrequently removed from the heat exchanger bundles, typically done only during a shutdown for plant-wide maintenance. Hydrocarbons, the principal constituent of the heat exchanger bundle sludge, should promote reduction of any chromium VI to chromium III, and the element lead would not be expected to be present in these sludges. Furthermore, the high temperatures and alkaline conditions to which these sludges would be exposed should reduce most of the chromium VI to chromium III. In any event, the KO50 sludges would constitute a very small part of the

total filter cake waste, and thus should not affect in any significant way the levels of lead and chromium in the filter cake wastes.[3/]

As previously noted, the K052 (tank bottom sludge) hazardous wastes will be disposed of pursuant to the applicable regulations at the time such sludge is removed from a tank. An assessment of the Rock Island manufacturing process has not otherwise resulted in the identification of any process, operation or feed material that can or might produce a waste not covered by the demonstration.

Description and quantity of waste generated. Aqueous condensate from storage tanks, process water and oil laden waters (slop oil emulsions) at the Refinery are collected and conducted by the Refinery's oily water sewer to the API separators. The API separators separate the incoming oily materials by physical means into oil, water and sludge. The oil is recovered, the water is further treated and the sludge obtained from the API separators is conveyed to the vacuum filter facility where the volume of the sludge is reduced and a relatively dry filter cake waste is produced. Each

---

[3/]Because sludge is removed from the heat exchanger bundle facility very infrequently (the last such occurence being in 1980), the test results in Tables 1 and 2 do not reflect any impact of that stream on the filter cake waste. For the reasons stated above, however, such impact would be expected to be insignificant.

month approximately 86 cubic yards (72.4 tons) of filter cake waste are produced at the Refinery.[4/] Annually, about 1032 cubic yards (869 tons) of filter cake materials are generated at the Refinery.

Criteria for listing the filter cake wastes. Filter cake wastes are Subpart D hazardous wastes because they contain the toxic constituents, lead and chromium, listed in 40 C.F.R., Part 261, Appendix VIII. 40 C.F.R. § 261.3(a)(2)(ii). The filter cake wastes generated at the Refinery, however, do not contain levels of lead and chromium that would be capable of posing a substantial present or potential hazard to human health or the environment even if improperly treated, stored, transported or disposed of, or otherwise managed.

The position of EPA with respect to the toxicity of lead and chromium, its persistence, and other environmental characteristics is discussed in the "Background Document, Resource Conservation and Recovery Act, Subtitle C--Identification and Listing of Hazardous Waste, §§ 261.31 and 261.32--Listing of Hazardous Wastes," USEPA Office of Solid Waste, May 2, 1980, pp. 671-707. The concentrations of lead and chromium in the filter cake waste are presented in Table 1.

The important consideration as regards the Rock Island filter cake waste is the potential of the lead and chromium constituents to migrate from the waste into the environment

---

[4/] The conversions from cubic yards to tons assume a density for the filter cake that is the same as water.

if improperly managed. The methods available to Rock Island for disposing of the filter cake wastes are landfilling and landfarming.

The worst case situation for improper waste management is anticipated to be disposal in a landfill which, because of design and operation, would provide an acidic environment that might permit enhanced dissolution of lead and chromium into leachate and ultimately into groundwater. To evaluate this worst case scenario, Rock Island contracted with EMS Laboratories to obtain representative samples of and make appropriate tests upon its filter cake waste. See Table 2. In accordance with 40 C.F.R. § 260.22(h), Rock Island has obtained demonstration samples, four in all, over a period of time (approximately five weeks) that are representative of the variability and uniformity of the filter cake waste. Each of these representative samples were then subjected to the EP test. 40 C.F.R., Part 261, Appendix II. EPA has observed:

> . . . EPA developed the EP test to simulate the physical processes which would occur in an actual landfill. . . . To simulate the acidic leaching medium which occurs in actively decomposing municipal landfills, EPA chose to employ an acetic acid leaching medium with a pH of 5.0 (± 0.2). To simulate the leaching process, EPA specified a procedure requiring mixing of the solid component of the waste with the acidic leaching medium for a period of 24 hours.

45 Fed. Reg. 33111 (May 19, 1980).

To duplicate the attenuation in concentration expected to occur between the point of leachate generation and the point of human or environmental exposure, EPA adopted an attenuation factor of 100. Applying this factor of 100 to the National Interim Primary Drinking Water Standards for lead and chromium, 40 C.F.R., Part 141, EPA established the benchmark for lead and chromium in a leachate derived from the extraction procedure set forth in 40 C.F.R., Part 261, Appendix II. As shown by the results presented in Table 2, the chromium levels present in the extract were less than one-sixth (1/6) of the level allowed by the EP toxicity limit, 40 C.F.R. § 261.24. Indeed, the chromium VI levels were less than detectable in all four samples. See Table 2. With respect to the lead in the extract, the levels were less than one-twenty-fifth (1/25) of the toxicity limit in 40 C.F.R. § 261.24. These low levels of lead and chromium in the EP extract demonstrate that the constituents are present in an essentially immobile form.[5/] See, e.g., 46 Fed. Reg. 40155, col. 3 (August 6, 1981).

These analyses demonstrate that even upon disposal of Rock Island's filter cake waste in an acidic environment,

---

[5/] The pH of the filter cake waste, as shown in Table 1, is above 7.0 in all samples tested, further support that the lead and chromium constituents are essentially immobile in the filter cake waste.

the worst case scenario, the levels of lead and chromium, particularly considering the type of chromium, would not pose any potential hazard to human health or the environment.

Sampling and testing procedures. The representative grab samples of filter cake waste were taken directly from the vacuum filter facility in accordance with 40 C.F.R., Part 261, Appendix I.[6/] The samples were placed in two liter borosilicate widemouth glass containers and sealed by means of tight-fitting, screw-type lids. Because of the stability of the constituents (lead and chromium) of concern, samples were not preserved prior to testing. The samples were not otherwise altered prior to testing.

The total analyses of the samples as reported in Table 1 were on an "as received" basis. The EP test was made in accordance with the procedures set forth in 40 C.F.R., Part 261, Appendix II. All analyses for the inorganic species reported in Table 2 were made in accordance with the chemical analysis test methods in 40 C.F.R., Part 261, Appendix III. The pH results in Table 1 were obtained by the electrode method. The total solids were ascertained by a gravimetric method of analysis. The name and model number of the instruments used in performing the tests are as follows: Fisher Accumet Expanded Scale Research pH Meter, Model 320; Six

---

[6/] Because the materials are admixed thoroughly in the API separator prior to treatment at the vacuum filter, they are believed to be fairly homogeneous.

Paddle Stirrer, Model 300, 110v 60HZ, Phipps & Bird, Inc., Richmond, A 23228, modified to comply with EP Toxicity requirements; Ohaus, Triple Beam Balance, 2610 capacity; Technicon Auto Analyzer System II, Technicon Sampler VI, S.C. Colorimeter, Mainfold, Pump, Pen Recorder; Perkin-Elmer, 360, Atomic Absorption Spectrophotometer, Perkin-Elmer HGA-2100 Controller, Fisher Recordall Series 500 Single Pen Recorder; Perkin-Elmer, 370, Atomic Absorption Spectrophotometer, Mercury Analysis System.

Subpart C characteristics of hazardous waste. Even if the filter cake waste is excluded by the Administrator from the lists of Subpart D hazardous wastes, the filter cake waste still may be a hazardous waste pursuant to 40 C.F.R., Part 261, Subpart C (Subpart C hazardous waste), and the burden of that determination lies with Rock Island. Based on studies of the filter cake waste and other information, Rock Island has determined that the filter cake waste is not a Subpart C hazardous waste, i.e., ignitable, corrosive or reactive and is not, based on the results set forth in Table 2, EP toxic, and Rock Island will not report nor treat its filter cake waste as a Subpart C hazardous waste.

Conclusion. For the above reasons Rock Island believes that the need and justification for its petition to exclude have been shown, and it requests that the Administrator grant its petition.

Respectfully submitted,

ROCK ISLAND REFINING CORPORATION

By William E Laque
William E. Laque
Coordinator of Environmental Affairs

BAKER & DANIELS

By Joseph B. Carney
Joseph B. Carney

George W. Pendygraft

Attorneys for Rock Island Refining Corporation

810 Fletcher Trust Bldg.
Indianapolis, IN 46204
317/636-4535

VERIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in the Petition for Regulatory Amendment to Exclude Hazardous Waste, the above Statement of Need and Justification for Exclusion and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there

are significant penalties for submitting false information, including the possibility of fine and imprisonment.

William E Laque

William E. Laque
Coordinator of Environmental Affairs

TABLE 1

TOTAL ANALYSES OF 1981 ROCK ISLAND DEMONSTRATION SAMPLES[1]

Test Parameter	Units	March 2	March 25	April 1	April 10	Mean
pH		9.0	7.8	8.1	9.7	
Total Solids	%	39.9	6.5	--	59	
Chromium (as received)	mg/kg	3062	165	362	1383	1243
Chromium (dry weight)	mg/kg	7674	2538	--	2344	4185
Lead (as received)	mg/kg	9.8	74	127	362	143
Lead (dry weight)	mg/kg	25	1138	--	614	592

[1] All analyses were performed on samples previously treated at the Refinery's vacuum filter facility.

TABLE 2

EP Toxicity Results For
Rock Island Demonstration Samples[1]

Test Parameter	March 2, 1981	March 25, 1981	April 1, 1981	April 10, 1981	Mean[2]	Maximum Allowable Concentration[3]
Arsenic	0.01*	0.02*	0.02	0.05*	0.03*	5.0
Barium	5.2	3.1	2.0	2.4	3.2	100.0
Cadmium	0.01*	0.01*	0.01*	0.01*	0.01*	1.0
Chromium VI	0.01*	0.01*	0.01*	0.01*	0.01*	--
Chromium	0.55	0.34	1.18	1.15	0.81	5.0
Lead	0.1*	0.4	0.1*	0.1*	0.2*	5.0
Mercury	0.0005*	0.0005*	0.0005*	0.0005*	0.0005*	0.2
Selenium	0.01*	0.02*	0.02	0.05*	0.03*	1.0
Silver	0.02	0.01	0.01	0.02	0.02	5.0

[1]/All results reported as milligrams per liter (mg/L).

[2]/Less than stated amount results included in mean at concentration shown in table.

[3]/See 40 C.F.R. § 261.24.

*Less than stated amount.

APPENDIX A

Names and Qualifications of Persons Sampling and Testing

Sampling: Clarence L. Tharpe, Asst. Laboratory Director
EMS Laboratories, Inc.
BS Chemistry, Butler University, Indianapolis, IN
MS Bionucleonics, Purdue Univ., W. Lafayette, IN
Nineteen (19) Years Environmental and Health Laboratory Experience

Testing: C. Steven Gohman, Laboratory Director

EMS Laboratories, Inc.
BA Chemistry, Indiana Univ., Bloomington, IN
Eight (8) Years Analytical Experience

Gary A. Klingler, Chief Chemist
EMS Laboratories, Inc.
BS Chemistry, Marion College, Indianapolis, IN
Six (6) Years Analytical Experience

Gail B. Copland, Staff Chemist
EMS Laboratories, Inc.
BS Chemistry, St. Lawrence Univ., Canton, N.Y.
MS Chemistry, Butler, Univ., Indianapolis, IN
Three (3) Years Analytical Experience (Organic Analysis)

Carl A. Mueller, Biologist
EMS Laboratories, Inc.
BS Biology, Purdue Univ., W. Lafayette, IN
Two (2) Years Analytical Experience

Charles A. Schneider, Laboratory Technician
EMS Laboratories, Inc.
BS Biology, Indiana Univ., Bloomington, IN
One (1) Year Analytical Experience

John S. Murray, Assistant Lab. Technician
Four (4) Years college, Major: Chemistry,
Indiana Univ., Bloomington, IN
Two (2) Years Analytical Experience

Tyler P. Jones, Assistant Lab. Technician
EMS Laboratories, Inc.
Two (2) Years College: University of Kansas
Two (2) Years Analytical Experience

Carolyn Burton, Assistant Lab. Technician
EMS Laboratories, Inc.
High School Diploma
Two (2) Years Analytical Experience

BAKER & DANIELS
810 FLETCHER TRUST BUILDING
INDIANAPOLIS, INDIANA 46204-2454
317-636-4535

WASHINGTON OFFICE:
SUITE 600 1920 N STREET N. W.
WASHINGTON, D. C. 20036
202-785-1563

Rec. 2/23/82
TK

February 19, 1982

Mr. Todd A. Kimmell
Environmental Scientist
Waste Characterization Branch
Hazardous and Industrial Waste
Division (WH-565)
United States Environmental
Protection Agency
Washington, DC 20460

Re: Information Supplementing the Petition of Rock Island Refining Corporation for Regulatory Amendment to Exclude Hazardous Waste

Dear Mr. Kimmell:

On October 16, 1981, Rock Island Refining Corporation (Rock Island) filed with the Administrator of the United States Environmental Protection Agency (EPA) its Petition for Regulatory Amendment to Exclude Hazardous Waste, seeking to delist the vacuum filter cake material generated at its Refinery. On February 8, 1982, you telephoned and requested an additional EPA EP toxicity analysis on the vacuum filter cake for total lead, total chromium and hexavalent chromium by the standard-addition method. The requested analyses have been made, and the results and other relevant materials are enclosed.

As you know, disposing of the vacuum filter cake wastes at a hazardous waste landfill is imposing significant costs on Rock Island. Thus, we are most appreciative of your cooperation and prompt consideration of this matter.

Very truly yours,

George W. Pendygraft, Ph.D.

GWP:jk
Enclosures

cc: William E. Laque
C. Steven Gohmann

February 18, 1982

Mr. Bill Laque
Rock Island Refinery
P.O. Box 68007
Indianapolis, IN 46268

RE: EMS Sample #26178

Dear Bill:

As you requested, EMS Laboratories, Inc. has performed an EP Toxicity extration procedure and analyzed the leachate for lead chromium and hexavalent chromium on the above referenced sample of solid waste submitted by you for analysis. The sample leachate was analyzed according to EPA approved methods. The sample was also analyzed after spiking. All pertinent data are listed on the table attached. Our calibration charts are enclosed.

Should you require additional clarification, please contact me at your convenience.

Sincerely,

C. Steven Gohmann, President
EMS LABORATORIES, INC.

CSG/lo

Enclosures

EMS LABORATORIES, INCORPORATED
7901 W. MORRIS • INDIANAPOLIS, IN 46231 • (317) 243-8304

Parameter	Concentration Found in Leachate (mg/l)	Value of Spike	Concentration Found in Spiked Leachate	% Recovery	* Corrected Concentration
Lead	0.2	5.0	5.1	98%	0.2
Total Chromium	0.29	.90	0.98	77%	.38
Hexavalent Chromium	< 0.01	1.0	0.70	70%	<.02

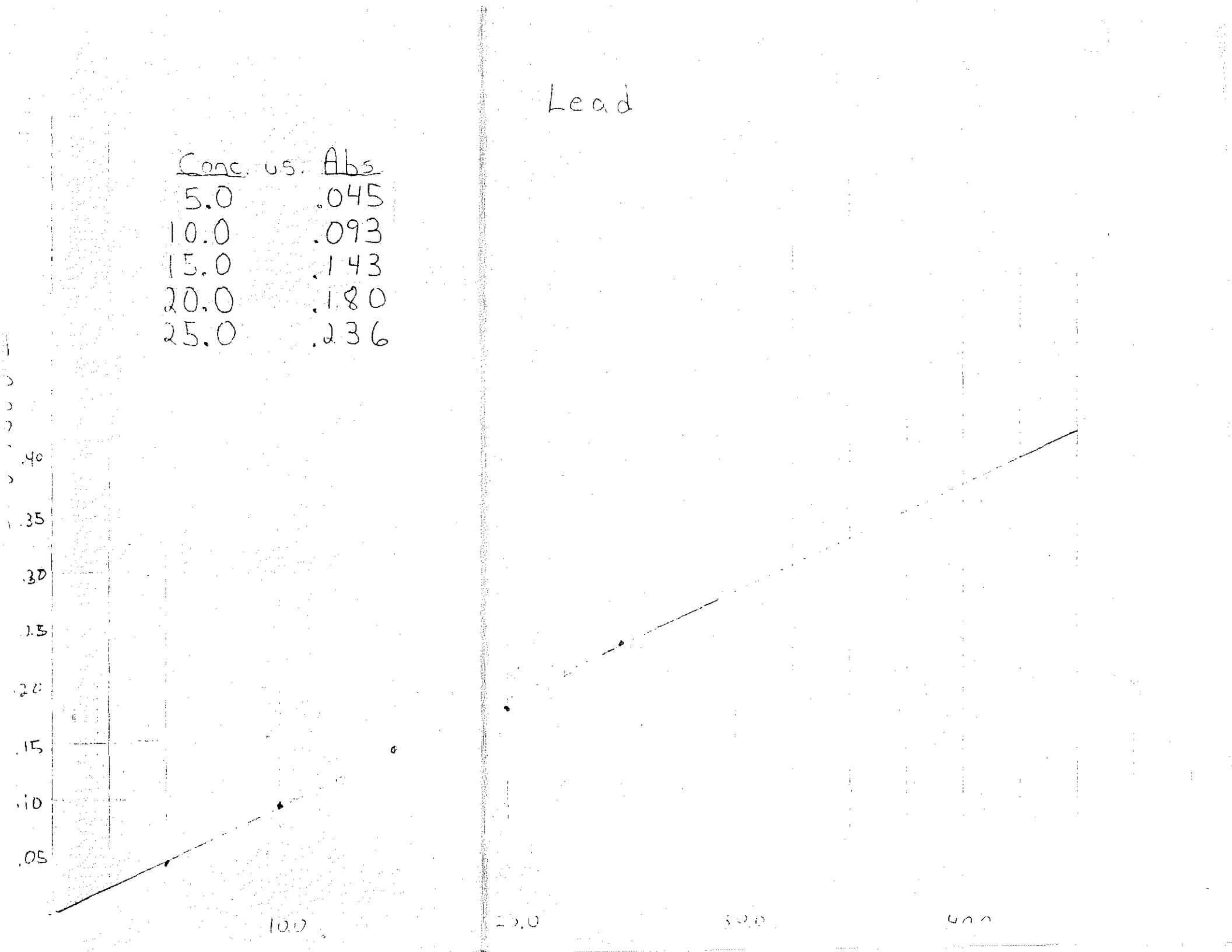
* Corrected concentration accounts for recovery of spike (i.e. method of standard additions).

Absorbance values of samples not included; instrument read directly in concentration values.

C. Steven Gohmann

Lead

Conc	vs.	Abs
5.0		.045
10.0		.093
15.0		.143
20.0		.180
25.0		.236



HAZARDOUS WASTE METHODS STUDIES SUPPORT SAMPLING MISSION #1 ROCK ISLAND REFINERY INDIANAPOLIS, INDIANA

Contract No. 68-01-7075
Assignment No. HWMSS-21

Draft Report

Re: Delisting Petition

Submitted to:

Myles Morse
Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

Presented by:

ERCO/A Division of ENSECO Incorporated
205 Alewife Brook Parkway
Cambridge, Massachusetts 02138

March 1986

TABLE OF CONTENTS

APPENDIX

A. ANALYTICAL DATA

- A.1 Filter Cake Sludge
- A.2 West Separators #1 and #2
- A.3 Holding Tank
- A.4 Suction Pit
- A.5 #1 Aeration Lagoon
- A.6 Trip Blank
- A.7 Procedural Blank
- A.8 Matrix Spike

B. CHAIN OF CUSTODY

C. PERSONNEL

1. INTRODUCTION

Work assignment 21 under Contract 68-01-7075 directs ERCO to assist the EPA in evaluating exclusion petitions by collecting and analyzing samples, and by reporting results relative to data previously submitted by the petitioner.

In October 1981, EPA received an exclusion petition from Rock Island Refinery Corporation (Rock Island) for their facilities in Indianapolis, Indiana. This petition supplied information and data to support Rock Island's claim that solid wastes generated by their waste treatment facilities be given a regulatory amendment and temporary exclusion pursuant to 40 CFR 260.22. To comply with EPA's previously stated policy of validating exclusion petition data, Rock Island's petition was chosen for a spot check.

This independent evaluation of the submitted petition data involved a sampling task. An EPA/ERCO sampling team arrived at the Rock Island facility in Indianapolis, Indiana on the afternoon of June 24, 1985. This sampling effort resulted in the collection of eight samples. Section 2 of this report includes a more detailed discussion of the sampling methodology employed during this task. Section 3 discusses how the samples were composited prior to analysis.

Samples were subjected to an EPA-approved program which included total inorganic and organic analysis and leachate studies. Descriptions of the analytical protocols are included in Section 4, while Section 5 summarizes and discusses the analytical data.

2. SAMPLING

Sampling of the Rock Island Refinery Corporation (Rock Island), Indianapolis, Indiana facility took place on June 24, 1985. The EPA and ERCO personnel who participated in this sampling mission are listed in Table 1.

Rock Island produces a wide range of petroleum products including gasoline, kerosene, distillate and residual fuel oils as well as other products derived from the processing and fractionation of crude oil. Processes employed at Rock Island range from distillation and redistillation to cracking. Rock Island intends to delist the following three wastes generated from these processes: slop oil emulsion solids (K049), heat exchanger bundle cleaning sludges (K050), and API separator sludges (K051).

All oily waste and process waters produced at the facility are fed into one of the two sets of API separators. The resulting sludge generated by the API separators is then pumped into the holding tank and suction pit which feed the vacuum filter press. Waste water from the treatment process is pumped to the aeration lagoons. (The vacuum filter press was not in operation during the visit and had been down since 9:00 a.m. that day. In addition, no dumpster was present below the press.)

A sampling plan was designed following a tour of the Rock Island waste treatment facility (Figure 1), using the information available from their exclusion petition and from conversations with EPA personnel.

Samples were collected at six sampling locations selected for the study. The sample locations, number of samples, and the

Table 1. Sampling Team Members

U.S. EPA, Washington, D.C.
Myles Morse
Scott Maid
ERCO/A Division of ENSECO, Cambridge, MA
Ian Phillips
Timothy Ward

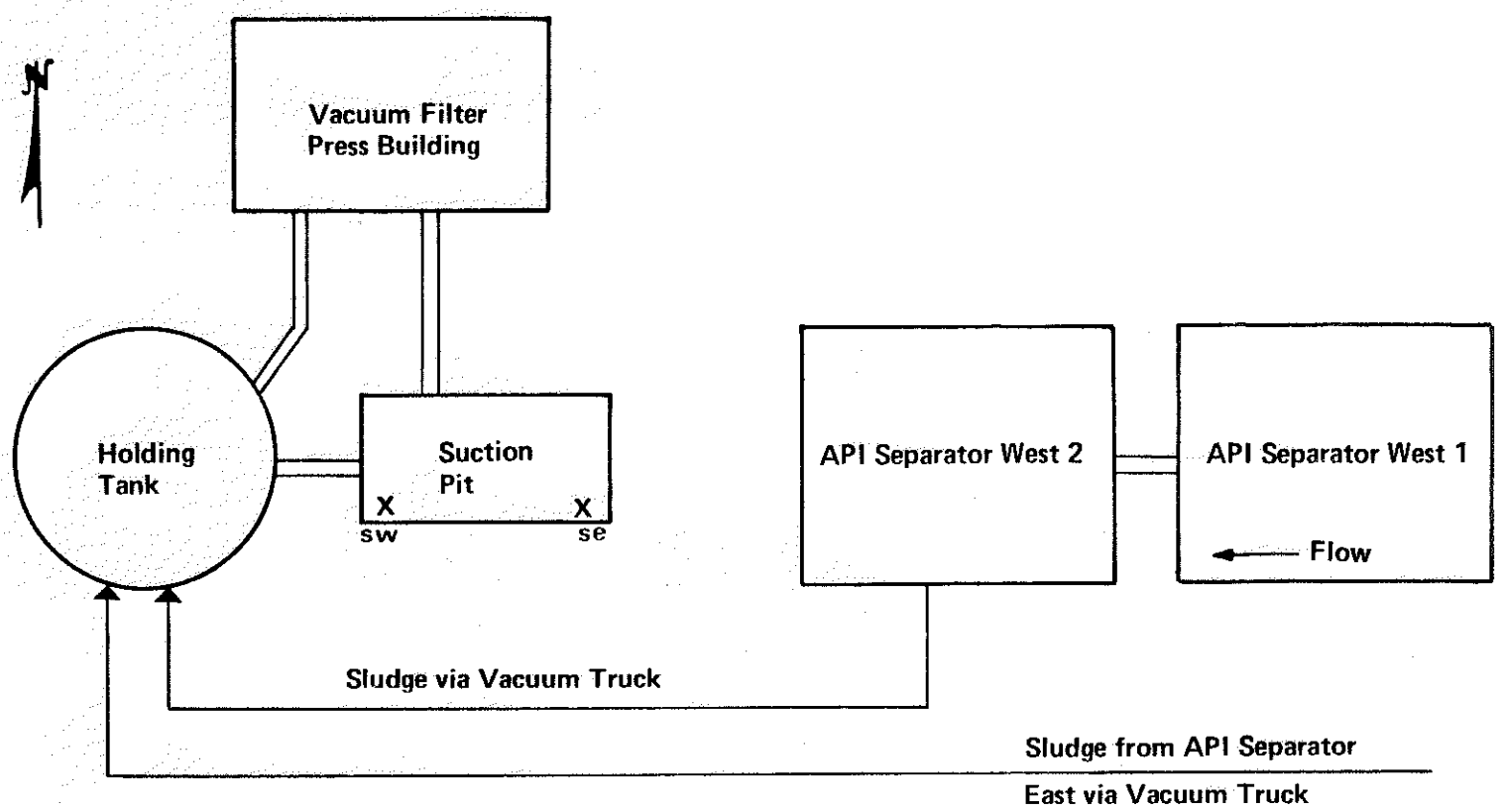


Figure 1. Waste treatment system, Rock Island Refinery, Indianapolis, Indiana.

associated types of analysis are compiled in Table 2. A compilation of the sampling equipment is given in Table 3. While on site, sample containers were always under the personal custody of a member of the sampling team or were secured in sealed coolers. Upon completion of sampling, samples were stored in sealed containers, chain-of-custody records were completed, and the samples were shipped to the ERCO laboratories. Duplicate samples requested by Rock Island were transferred to Rock Island personnel.

The remainder of this section discusses the sampling methodology employed according to the specific location. In all cases, an attempt was made to collect samples in an unbiased, random manner as specified by Section 1.0 of "SW-846 Test Methods for Evaluating Solid Wastes" (second edition).

2.1 Filter Cake Sludge

As mentioned, the vacuum filter press had not been in operation since the morning of the visit and, therefore, no sample could be taken while the system was in operation. In addition, the dumpster in which the sludge is collected had been removed. Residual filter cake sludge located in the chute beneath the filter press was taken as a grab sample. One 1-liter wide-mouth jar and three 40 ml VOA vials were filled using a PVC spatula. The wide-mouth jar had been acid- and methanol-cleaned and the VOA vials had been detergent-washed and baked prior to use.

2.2 API Separators West

The two API West separators were both sampled through ports approximately 2 inches in diameter in the covers of the separators. Two grab samples were collected through the

Table 2. Inventory of Samples Collected at the Rock Island Refinery Facility, June 24, 1985

Sampling Location[a]	NO. OF SAMPLES	NO. OF SAMPLE CONTAINERS	TYPE OF ANALYSIS					
			TOTAL METALS	TOTAL & AMENABLE CYANIDE	REACTIVE SULFIDE	PRIORITY POLLUTANT ORGANIC COMPOUNDS	TOC	EP-EXTRACTION PROCEDURE
Filter Cake	1	4	o	o	o	o	o	o
West Separator	2	8	o	o	o	o	o	o
Holding Tank	2	8	o	o	o	o	o	o
Suction Pit	2	8	o	o	o	o	o	o
Aeration Lagoon	1	4	o	o	o	o	o	o

[a]Sample locations are discussed in more detail in the following pages of this section.

Table 3. Sampling Supplies

Personnel Equipment

4 Respirators
8 Pair Respirator Cartridges
4 Hard Hats
4 Pair Goggles
2 Full Face Shields
2 Sets Rain Gear
2 Pair Boots
12 Sets Disposable Coveralls
2 Pair Long Cuff Acid-Resistant Gloves
2 Pair Short Cuff Acid-Resistant Gloves
6 Pair Cloth Work Gloves

Safety Equipment

1 Portable Eye Wash Station
1 ABC Fire Extinguisher
1 First Aid Kit
2 Flashlights

On-Site Testing Equipment

1 Portable pH Meter
pH paper
1 Draeger Air Sampling Kit (Benzene, Methylene Chloride, Toluene, Hydrocyanic Acid, Hydrogen Sulfide)
4 Thermometers

Sample Containers

132 1-l Wide-mouth Glass Bottles (acid- and solvent-cleaned)
190 40-ml VOA vials (cleaned)
16 1-l Poly Bottles (acid-cleaned)
16 500-ml Poly Bottles (with NaOH)
6 1-gallon Glass Bottles (solvent-cleaned)
Sample Bags (miscellaneous sizes including zip-loc bags)

Table 3. Continued

Sampling Apparatus

3 Tape Measures (100 feet each)
2 Compasses
8 Pile Samplers
1 Pond Sampler
2 Shovels
1 Pick
1 Sledge Hammer
Site Stakes
Hardwood Boards
1 Tool Kit
Large Spatulas
Small Spatulas
Disposable 100-ml Plastic Beakers
4 Sample Carriers
Funnels
3 Boxes Disposable Gloves
6 Rolls Paper Towels
Large Trash Bags

Sample Documentation and Office Equipment

Razor Knife
Pens and Pencils
Marking Pens
Clip Boards
Paper Pads
Scissors
Field Notebooks
Chain-of-Custody Forms
Site Forms
Graph Paper
Random Number Tables
Sampling Plan
ERCO Sampling Labels
Sample Tags
Shipping Labels
Clear Plastic Tape
Packing Tape
Duct Tape

western-most ports in the separator covers. The API East separators were not inspected or sampled during the visit.

The separators were sampled with equipment provided by Rock Island. An eight- to ten-foot PVC pipe was lowered into each port and worked in through the sludge to the bottom of the separator. The top of the pipe was capped and the pipe was removed. The bottom 2 feet, which was considered the sludge, was then collected into one 1-liter wide-mouth jar and three 40-ml VOA vials. The wide-mouth jar had been acid- and methanol-cleaned and the VOA vials had been detergent-washed and baked prior to use. The sludge in Separator #1 appeared to be thicker than the sludge in Separator #2.

2.3 Holding Tank

The holding tank which receives the sludge generated at both the east and west separators was 12 feet tall and had a port opening on the top and a valve at the bottom of the tank. The holding tank was sampled at both the port on the top of the tank and at the valve at the bottom.

The port at the top of the tank was sampled by attaching a bottle to the end of a 5-foot PVC pole and lowering it into the liquid. Since the liquid level within the tank was approximately 3.5 to 4 feet from the top of the tank, only the top one to two feet of sludge could be sampled. One 1-liter wide-mouth jar and three 40-ml VOA vials were each half filled. The remainder of the sample containers were then filled from the valve at the base of the tank. Before the valve was sampled it was opened and any stagnant material was allowed to flow out. A field duplicate sample was taken at the holding tank exactly in the same manner the original sample was taken. The composite samples taken from the holding tank were at an elevated temperature at the time of sampling.

The separators were sampled with equipment provided by Rock Island. An eight- to ten-foot PVC pipe was lowered into each port and worked in through the sludge to the bottom of the separator. The top of the pipe was capped and the pipe was removed. The bottom 2 feet, which was considered the sludge, was then collected into one 1-liter wide-mouth jar and three 40-ml VOA vials. The wide-mouth jar had been acid- and methanol-cleaned and the VOA vials had been detergent-washed and baked prior to use. The sludge in Separator #1 appeared to be thicker than the sludge in Separator #2.

2.3 Holding Tank

The holding tank which receives the sludge generated at both the east and west separators was 12 feet tall and had a port opening on the top and a valve at the bottom of the tank. The holding tank was sampled at both the port on the top of the tank and at the valve at the bottom.

The port at the top of the tank was sampled by attaching a bottle to the end of a 5-foot PVC pole and lowering it into the liquid. Since the liquid level within the tank was approximately 3.5 to 4 feet from the top of the tank, only the top one to two feet of sludge could be sampled. One 1-liter wide-mouth jar and three 40-ml VOA vials were each half filled. The remainder of the sample containers were then filled from the valve at the base of the tank. Before the valve was sampled it was opened and any stagnant material was allowed to flow out. A field duplicate sample was taken at the holding tank exactly in the same manner the original sample was taken. The composite samples taken from the holding tank were at an elevated temperature at the time of sampling.

2.4 Suction Pit

The uncovered suction pit, which is located at the base of the holding tank, functions in a similar manner to the holding tank. It measures 13 x 12 ft and has conical sides to promote settling of solids in the center, which is approximately 5 ft deep.

The suction pit was sampled in two locations: along the southern edge and along the eastern edge. The total length of each side was measured and a random distance was selected along each edge using a random number table. The sample along the southern edge was sampled 4 feet from the southwest corner, while the eastern edge sample was taken 2 feet from the southeast corner. The samples were taken using a pond sampler (Figure 2), which was lowered to the bottom and raised to the surface at an even rate, so as to allow the sample to be representative of the entire depth. When the sampling bottle was filled the sample was aliquoted into one 1-liter wide-mouth jar and three 40-ml VOA vials. The wide-mouth jar and the VOA vials were prepared as discussed in Section 2.1.

This procedure was followed exactly for both samples, excepting that a separate sampling bottle was used for each sample taken.

2.5 #1 Aeration Lagoon

Effluent waters from the API separators are pumped to a series of six aeration lagoons for final clarification. The effluent enters the primary aeration lagoon (#1 Aeration Lagoon), the first lagoon in the process, via a pipe which empties into its southwest corner. The lagoon, which is unlined, has approximate dimensions of 50 by 200 ft. The pit

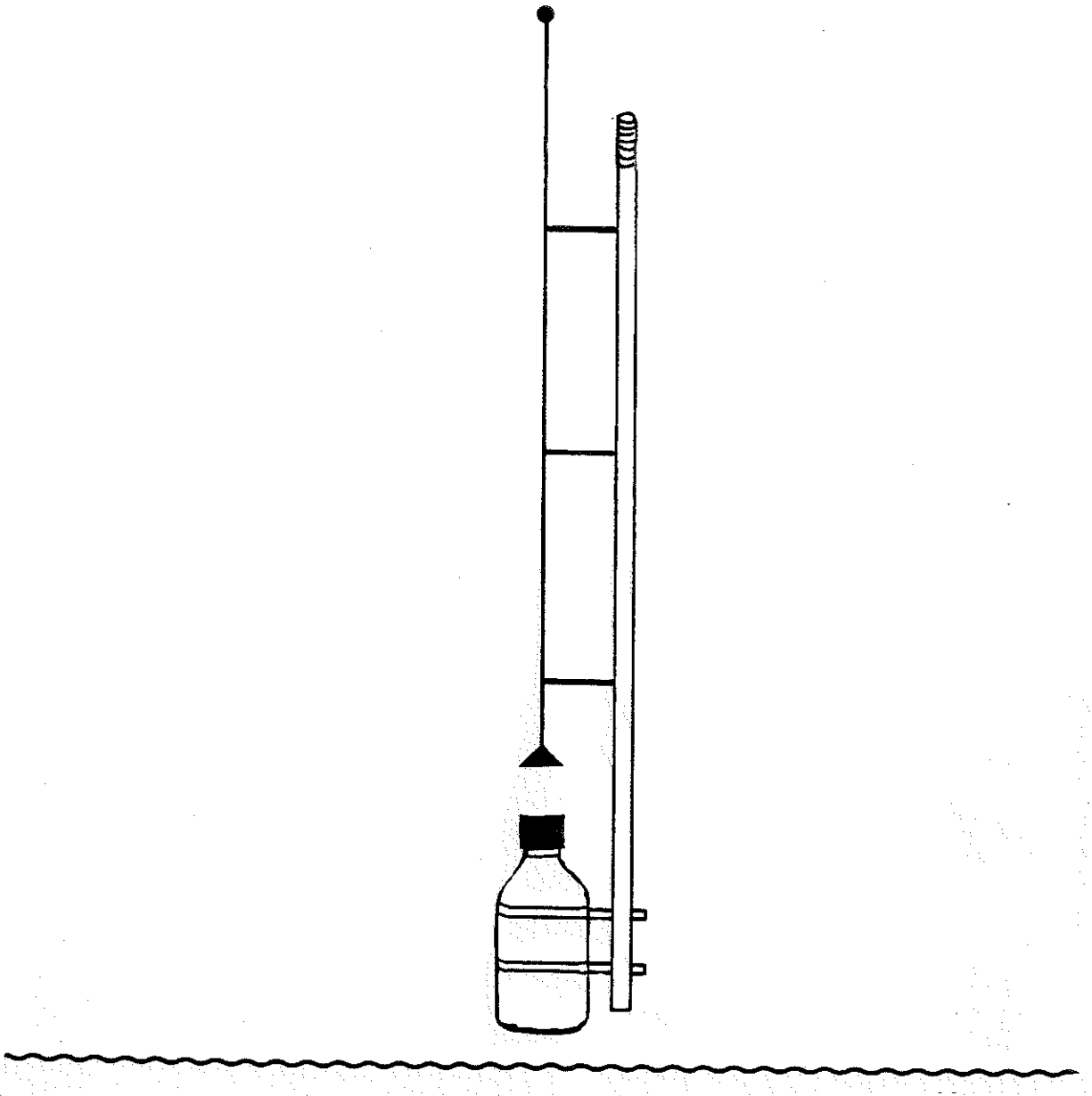


Figure 2. Pond sampler.

appeared close to its capacity with sludge and had a small aqueous stream running diagonally from the southwest corner (from the discharge pipe) to the northeast corner.

Due to time and access constraints, one grab sample was taken 20 feet from the southwest corner along the western edge. This location was chosen because of accessibility problems posed by the steep and soft edges of the lagoon. The sample was taken using a PVC pile sampler (Figure 3). The pile sampler was entered into the sludge at an angle with hand pressure. A core sample approximately 2-3 feet long was removed and transferred to one 1-liter wide-mouth jar and three 40-ml VOA vials. The sample storage containers were prepared as discussed in Section 2.1.

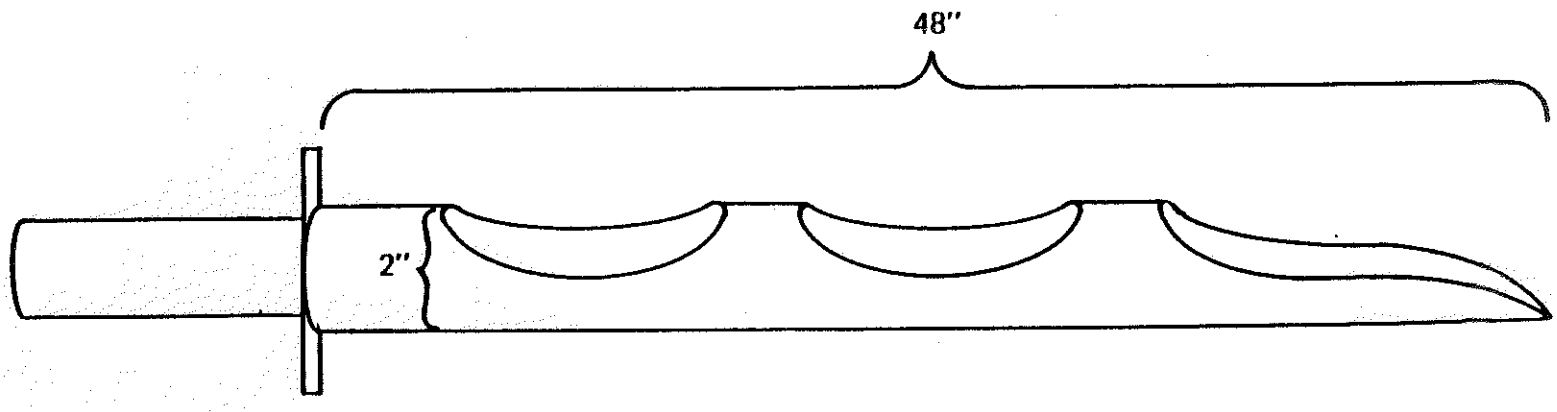


Figure 3. PVC Pile Sampler.

3. SAMPLE COMPOSITES

Due to the individual nature of the samples collected, no compositing was performed in the laboratory.

Upon close examination of the samples at the laboratory, it was determined that the two holding tank samples and the two suction pit samples had three distinct layers: oil, water and sediment. Following consultation with EPA personnel, it was decided that, wherever possible, each layer would be run as a separate sample. All three phases could only be analyzed for volatile organics due to the large volumes necessary to perform the majority of the analyses, therefore, only the sediment and the oil phases were analyzed for total metals, inorganic parameters, base/neutral and acid extractables, pesticides and PCB's. In addition, Suction pit sample #1 could not be separated and was run as a single sample. The Oily Extraction Procedure (Oily EP) was run on each sample without distinguishing between phases.

Samples and their IDs are outlined in Table 4.

Table 4. Rock Island Refinery, Indianapolis, Indiana - Samples and Composites

Sample ID	ERCO ID
#1 Aeration Lagoon	17507
Filter Cake	17508
West Separator Sample #1	17509
West Separator Sample #2	17510
Holding Tank Sample #1	17511
Oil	
Sediment	
Water[a]	
Holding Tank Sample #2	17512
Oil	
Sediment	
Water[a]	
Suction Pit Sample #1[b]	17513
Oil	
Sediment	
Water[a]	
Suction Pit Sample #2	17514
Oil	
Sediment	
Water[a]	
Procedural Blank	17516

[a]Method 624 only.
[b]Separate phases for Method 624 only.

4. ANALYSIS

Nine samples were collected for analysis at the Rock Island, Indianapolis, Indiana Refinery. The analytical plan for these samples specified 91 separate analytical tests exclusive of quality control. This analytical plan is summarized in Table 5.

The types of analytical methods employed during this program can be classified as either total analysis methods or leachate methods. The total analyses included both organic and inorganic methods while leachate studies were restricted to the determination of inorganic species using the Oily Extraction Procedure (Oily EP) leachates. The Oily EP was run as specified in "Test Methods for Solid Wastes" SW-846 Method #1330. Table 6 is a compilation of the analytical instrumentation employed for the analysis of both inorganic and organic parameters.

Results of laboratory quality control analysis, spikes, and blanks are included in Section Five.

4.1 Total Analysis

All samples, including Oily EP leachates, were subjected to inorganic analysis. Samples were prepared for inorganic analysis according to the preparative methods listed in Table 7. Method 3050 was modified by the addition of a condenser to prevent the loss of volatile metals and organometallic metals during the extended time periods necessary to digest the samples. In addition, only nitric acid and hydrogen peroxide were used in the digestion to prevent the formation of volatile chlorides of arsenic, selenium and thallium when hydrochloric acid is also employed. The sample

Table 5. Analytical Program

Analytical Parameter	Analytical Method	SW-846 Analytical Method	Number of Analyses by Sample Type: #1 Aeration Lagoon	Filter Cake	West Separator Samples #1 & #2	Holding Tank Samples #1 & #2	Suction Pit Samples #1 & #2
Total Analysis							
Inorganic							
--Metals	ICP AA	6010 7040-7951	1	1	2	4	3
--Cyanide	Colorimetric	9010	1	1	2	4	3
--Sulfide	Colorimetric	9030	1	1	2	4	3
Organic							
--TOC	Carbonaceous Analyzer	9060	1	1	2	4	3
--Oil & Grease	Gravimetric	3540	--	1	--	--	--
--Acid and B/N Extractables	GC/MS	8270	1	1	2	4	3
--Pesticides	GC	8080	1	1	2	4	3
--Purgeables	GC/MS	8240[a]	1	1	2	6	6
Leachate Studies							
--Metals	EP	1330	1	1	2	2	2

[a]An NEIC/EPA method was employed for analysis of volatile compounds. In solids it is similar to Method 8240, but tetraglyme is substituted for polyethylene glycol (PEG).

Table 6. Analytical Instrumentation

Analytical Parameter	Instrumentation		
	Type	Make	Model
Inorganic			
Metals	Inductively Coupled Argon Plasma Spectrometer	Jarrell-Ash	970
	Atomic Absorption Spectrometer	Perkin-Elmer Perkin-Elmer	603 Zeeman 3030
Cyanide	Auto Analyzer	Technicon	II
Organic			
Acid and B/N Extractables	Gas Chromatograph/ Mass Spectrometer/ Data System	Hewlett-Packard Finnigan	5985A 4500
Pesticides	Gas Chromatograph	Hewlett-Packard	5880A
Purgeables	Gas Chromatograph Mass Spectrometer/ Data System	Hewlett-Packard Hewlett-Packard	 5996
TOC	Total Carbon Analyzer	Dohrmann/Xertex	DC80

digestates were screened by inductively coupled argon plasma (ICP). If an Oily EP leachate concentration was equal to or greater than one-third of a maximum concentration level (MCL), the concentration was verified by atomic absorption spectroscopy.

Table 7 also lists the preparative methods that were employed for organic analysis. As the table implies, leachates were not analyzed for organic parameters. However, the samples themselves were analyzed for the full suite of organic priority pollutants. Since past experience had indicated that these types of sample matrices can cause analytical interferences, the samples were automatically subjected to a column cleanup, prior to analysis for organic compounds. In addition, a separate PNA standard was run in triplicate which allowed for reduction in their respective reporting limits of up to five-fold.

4.2 Leachate Analysis

The samples were subjected to the Extraction Procedure (EP) toxicity test. The leachates were analyzed for inorganic parameters as discussed in the preceding subsection.

In the final mobile metal concentration (MMC) calculation, if a metal was detected in one or two of the three leachate phases (filtrate, THF/toluene extract, and EP leachate) a value of zero was assigned to any remaining phase(s) where a "less than reporting limit" had been given in the original data. If the MMC approached one-third the maximum concentration level (MCL), a second calculation was performed to determine the additional concentration which would be contributed if a metal were present just below the reporting limit. This concentration value is given in brackets on the final data sheet. Finally, in the event that no metals were detected above the reporting limit

Table 7. Sample Preparation Method for Total Analysis

Sample Type	SW-846 Inorganic Sample Preparation Method	SW-846 Organic Sample Preparation Method
Water	6010	3510
Leachates	6010	--
Solids	3050[a]	3540

[a]A modified Method 3050 was employed.

in any of the leachate phases, the MMC was calculated using the reporting limit values and marked as "less than" on the final data report.

4.3 Analytical Difficulties

Analytical difficulties were encountered during the analysis of samples collected at the Rock Island, Indianapolis, Indiana Refinery. All of the difficulties were resolved through dilution of the samples.

5. RESULTS AND DISCUSSION

This section discusses the data, while the complete data are included in Appendix A. Quality control data are presented in separate subsections of Appendix A.

Samples were subjected to both inorganic and organic analyses, while leachates generated by processing these samples according to the Oily Extraction Procedure (Oily EP) were only subjected to inorganic analysis.

In reviewing the analytical data, the following points can be made:

- Priority pollutant volatile organics were detected at levels of 15,000 to 250,000 ppb in the filter cake, while the holding tank, suction pit, and separator samples contained levels ranging from 2,300 to 3,900,000 ppb. The aeration lagoon contained levels ranging from 9,000 to 270,000 ppb.

- Base/neutral and acid extractable organics were detected in the filter cake at levels ranging from 710 to 290,000 ppb. The holding tank, suction pit, and separator samples contained levels of 460 to 2,200,000 ppb, while the aeration lagoon ranged from 150 to 170,000 ppb.

- Samples of solid waste contained metals in the following concentrations:

  - arsenic: ranged from <2.3 to 12 ppm
  - barium: ranged from 13 to 200 ppm
  - cadmium: ranged from <0.47 to 0.93 ppm
  - chromium: ranged from 35 to 510 ppm
  - copper: ranged from 1.9 to 80 ppm
  - lead: ranged from 6.0 to 54 ppm
  - mercury: ranged from 0.45 to 0.74 ppm
  - nickel: ranged from 2.7 to 24 ppm
  - selenium: less than 2.5 ppm
  - silver: less than 0.50 ppm
  - zinc: ranged from 19 to 430 ppm

- Of the samples of waste tested for leachable metal Oily Extraction Procedure (Oily EP), none failed.

- Additional oil refinery waste compounds were detected in the base/neutral and acid extractables and total metals analyses.

- Reactive sulfide was detected in three samples ranging from 7.0 to 1,680 ppm, while cyanide was detected in two samples at concentrations below 1 ppm.

- No priority pollutant pesticides or PCBs were found in any of the samples collected.

5.1 Filter Cake

The one grab sample removed from the filter press chute (Section 2.1) was subjected to total analysis for organic and inorganic parameters, as well as to the Oily Extraction Procedure (Oily EP) toxicity test.

Volatile analysis of the filter cake sample detected four priority pollutant compounds: methylene chloride, toluene, ethylbenzene, and xylenes. Methylene chloride and toluene were detected at 15 and 36 ppm, respectively, while ethylbenzene and total xylenes were detected at 33 and 250 ppm. Base/neutral and acid extractable organics were detected at levels ranging from 710 ppb to 290,000 ppb. Of note were anthracene at 42 ppm, benzo(a)pyrene at 54 ppm, chrysene at 290 ppm, and phenanthrene at 280 ppm. Additional oil refinery waste compound 1-methylnaphthalene was detected at 81 ppm. Total metal analysis indicated notable levels of chromium (510 ppm), as well as other metals at various concentrations. Additional oil refinery waste compound vanadium was detected at 50 ppm. The Oily EP leachate did not show any metal concentrations above the maximum concentration level (MCL). No priority pollutant pesticides or PCBs were detected.

5.2 API Separators West

The two samples removed directly from the two API separators (Section 2.2) were subjected to analysis for organic and inorganic parameters, as well as to the Oily EP toxicity test.

For almost all parameters tested, the concentrations of contaminants in the API separator West #1 were higher than those in separator #2 with the exception of some PNAs in the base/neutral fraction.

Volatile organics were detected in west separator #1 at high levels. Most notably, benzene was detected at 290 ppm, toluene at 1,500 ppm, and total xylenes at 1,900 ppm. In addition, chloroform, methylene chloride, and tetrachloroethene were detected well into the part-per-million range. The west separator #2 also contained volatile organics in the ppm range, however, not at the elevated levels found in separator #1. Methylene chloride, chloroform, 2-butanone (MEK), and toluene were all also detected in west separator #2.

Only west separator #1 contained compounds in the acid fraction. Phenol and 2,4-dimethylphenol were detected at 3,800 and 12,000 ppb, respectively. PNAs were detected well into the ppm levels in the base/neutral fraction, with chrysene, anthracene, and dibenzo(a,h)anthracene being detected at 540, 390 and 2,200 ppm, respectively. West separator #2 also contained similar PNAs in the high ppm range. Both separators contained 1-methylnaphthalene (additional oil refinery waste compound) at levels in the high ppm range.

Total metal analysis gave notably high values only for chromium (350 ppm) in west separator #1. Various other metals were detected in the ppm range. Vanadium (additional oil

refinery waste compound) was detected at 16 ppm in separator #1. The Oily EP leachates did not show any metal concentrations above the MCL. Cyanide was not detected in either separator, while sulfide was detected at 13 and 7.0 ppm in separators #1 and #2, respectively.

No priority pollutant pesticides or PCBs were detected in either separator sample.

5.3 Holding Tank

The two holding tank samples were collected as field duplicates. Upon arrival at the laboratory, as mentioned in Section 3, the holding tank samples (as well as the suction pit samples) were found to contain three phases: oil, water, and sediment. As discussed, the three phases were handled separately for the volatile organics analysis, while only the sediment and oil were analyzed separately for the remaining parameters due to the volume of water available for analysis. All of the duplicates were excellent with the exception of the sediment for volatile and semivolatile organics which were generally good.

5.3.1 Oil Phase

Seven priority pollutant volatile organics were detected in the oil phase of the holding tank samples: methylene chloride, chloroform, 2-butanone (MEK), benzene, toluene, ethylbenzene, and xylenes. Concentrations ranged from 41 to 2,500 ppm with methylene chloride at 41, benzene at 85, and chloroform at 110 ppm being of largest concern. Organic extractables were only detected in the base/neutral fraction in the range of 30 to 610 ppm. Anthracene, chrysene, and phenanthrene were detected

at 120, 400 and 610 ppm, respectively. 1-methylnaphthalene and indene (additional oil refinery waste compounds) were also detected. Total metal analysis of the oil phase indicated levels of barium, chromium, lead, mercury, copper, nickel, and zinc. No priority pollutant pesticides or PCBs were detected.

5.3.2 Sediment Phase

The same seven volatile organics which were detected in the oil phase were also detected in the sediment phase with methylene chloride, chloroform, and 2-butanone having concentrations slightly lower than the oil phase, and benzene, toluene, ethylbenzene, and xylenes containing higher concentrations. Phenol and 2,4-dimethylphenol were detected in the acid fraction of the sediment phase at levels of 1,500 and 860 ppb, respectively. The base/neutral extractables were lower in all cases in the sediment phase versus the oil phase, however, levels were still well into the ppm range. Total metals analysis showed comparable levels in the sediment in relation to the oil phase. Again, no pesticides or PCBs were detected.

5.3.3 Water Phase

The water phase contained the same volatile organics as the oil and sediment phases at concentrations which were generally lower yet still well into the ppm range. In addition, the water phase of holding tank sample #1 showed 22 ppm of 1,1-dichloroethene, while the duplicate did not show this compound.

5.3.4 Oily EP

The Oily EP leachates did not show any metal concentrations above the MCL, however, if lead were detected just below the detection limit it would be approaching one-third the MCL.

5.4 Suction Pit

Two grab samples were taken from the suction pit (Section 2.4) and subjected to total analysis for organic and inorganic parameters, as well as to the Oily EP toxicity test. Suction pit sample #1 did not contain separable phases for any of the analyses except the volatile organic analysis which allowed for three-phase analysis as discussed previously (Section 3). Suction pit sample #2 allowed for two-phase analysis (oil and sediment) for all analyses, as well as water analysis for the volatile organics.

5.4.1 Sample #1

Toluene, ethylbenzene, and xylenes were detected in all three phases of suction pit sample #1 at concentrations ranging from 18 to 67 ppm in the water phase to 210 to 1,100 ppm in the oil phase. In addition, the oil and sediment phases contained benzene at 20 and 11 ppm, respectively. The water phase contained 2.9 ppm of chloroform, while the oil phase contained 11 ppm of methylene chloride. Organic extractables were detected in both the acid and the base/neutral fractions. Phenol and 2,4-dimethylphenol (560 and 2,300 ppb, respectively) were detected in the acid fraction, while a wide range of PNAs were detected in the base/neutral fraction. Of particular note were benzo(a)pyrene at 200 ppm, chrysene at 720 ppm, and phenanthrene at 680 ppm. 1-methylnaphthalene was detected at

290 ppm. Total metal analysis detected barium, chromium, lead, mercury, copper, nickel, and zinc among other metals. Vanadium was detected at 6.2 ppm. The Oily EP leachate did not show any metal concentrations above the MCL, however, if lead were detected just below the detection limit it would be approaching one-third the MCL.

5.4.2 Sample #2

Ethylbenzene and toluene were detected in all phases of the suction pit sample #2 at concentrations ranging from 2.3 and 9.3 ppm, respectively, in the water phase to 100 and 150 ppm in the oil phase. The sediment and oil phases also contained xylenes at 410 and 700 ppm, respectively, while the sediment and water phases contained methylene chloride in the 20 ppm range. The base/neutral fractions for both the sediment and oil phases contained high levels of PNAs, while only the acid fraction of the sediment sample contained relatively slight levels of phenol (460 ppb). The base/neutral fractions of both the sediment and the oil gave concentrations of benzo(a)pyrene, chrysene, and phenanthrene at levels ranging from 170 to 710 ppm. 1-methylnaphthalene was detected at 370 and 660 ppm in the sediment and oil, respectively. Total metal analysis indicated levels of the previously mentioned metals, as well as vanadium at 5.4 and 18 ppm in the oil and sediment phases, respectively. The Oily EP leachate did not show any metal concentrations above the MCL, however, if lead were detected just below the detection limit it would be approaching the MCL.

5.5 #1 Aeration Lagoon

The one grab sample removed from the #1 aeration lagoon (Section 2.5) was subjected to total analysis for organic and inorganic parameters, as well as to the Oily EP toxicity test.

Chloroform, 2-butanone (MEK), benzene, toluene, ethylbenzene, and xylenes were detected in the volatile analysis at levels ranging from 9.0 to 270 ppm. Phenol and 2,4-dimethylphenol were detected in the acid fraction (150 and 1,600 ppm, respectively), while various PNAs were detected in the base/neutral fraction, most notably benzo(a)pyrene, chrysene, and phenanthrene (59, 170 and 150 ppm, respectively). Total metal concentrations were comparable to those for the filter cake, with elevated concentrations of chromium (480 ppm) and additional oily waste compound, vanadium, at 42 ppm. The Oily EP leachate did not show any metal concentrations above the MCL. Reactive sulfide was detected at 1,680 ppm, while total cyanide was detected at 0.879 ppm.

5.6 Quality Control

Section A.6 of Appendix A contains the trip blank data, while A.7 contains the procedural blank data for the samples analyzed during this project. In all cases, the blank levels are below reporting limits or at concentrations not considered significant versus the samples. Section A.8 contains the sample spike recoveries obtained during this mission. Spike recovery levels on all the pesticide and PCB and base/neutral extractables analyses were 0% due to the high dilution factors necessary to analyze the samples.

APPENDIX A

APPENDIX A.1

- Filter Cake Sludge -

Date Sampled: 6/24/85

Analysis Completed: 7/5/85

All Results in: ng/g (ppb)

Reported by:

Checked by:

Client: HWMSS 21 Rock Island Refinery

ERCO / A Division of ENSECO

VOLATILE ORGANICS ANALYSIS

BY EPA METHOD 624

- Data Report -

Compounds	Minimum Reporting Limit	Client ID: ERCO ID:	Filter Cake/Sludge 17508
Chloromethane	4,350		ND
Bromomethane	4,350		ND
Vinyl chloride	4,350		ND
Chloroethane	4,350		ND
Methylene chloride	4,350		15,000
Acetone	43,500		ND
Carbon disulfide	870		ND
1,1-dichloroethene	870		ND
1,1-dichloroethane	870		ND
Trans-1,2-dichloroethene	870		ND
Chloroform	870		ND
1,2-dichloroethane	870		ND
2-Butanone	8,700		ND
1,1,1-trichloroethane	870		ND
Carbon tetrachloride	870		ND
Vinyl acetate	870		ND
Bromodichloromethane	870		ND
1,2-dichloropropane	870		ND
Trans-1,3-dichloropropene	870		ND
Trichloroethene	870		ND
Dibromochloromethane	870		ND
1,1,2-trichloroethane	870		ND
Benzene	870		ND
Cis-1,3-dichloropropene	870		ND
2-Chloroethylvinylether	870		ND
Bromoform	870		ND
2-Hexanone	8,700		ND
4-Methyl-2-pentanone	8,700		ND
Tetrachloroethene	870		ND
1,1,2,2-Tetrachloroethane	870		ND
Toluene	870		36,000
Chlorobenzene	870		ND
Ethylbenzene	870		33,000
Styrene	870		ND
Total xylenes	870		250,000

ND = Not detected.
Unknowns present - see attached sheet.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS 21

CLIENT ID: Filter Cake

ERCO ID: 17508

CAS NUMBER	COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
23799259	Cycloheptane, 1-methyl-4-methylene	VOA	1051	44,000
103651	Propyl benzene	VOA	1390	44,000
98828	Benzene, 1-methylethyl	VOA	1568	160,000

CLIENT: HWMSS-21 (Rock Island Refinery)
CLIENT ID: Filter Cake Sludge
ERCO ID: 17508
SAMPLE RECEIVED: 7/2/85
ANALYSIS COMPLETED: 8/22/85
RESULTS IN: µg/kg (ppb) dry weight

ERCO / A Division of ENSECO

SUMMARY OF
ORGANIC PRIORITY POLLUTANT ANALYSIS

	ACID COMPOUNDS	
21A	2,4,6-trichlorophenol	ND
22A	p-chloro-m-cresol	ND
24A	2-chlorophenol	ND
31A	2,4-dichlorophenol	ND
34A	2,4-dimethylphenol	710
57A	2-nitrophenol	ND
58A	4-nitrophenol	ND
59A	2,4-dinitrophenol	ND
60A	4,6-dinitro-o-cresol	ND
64A	pentachlorophenol	ND
65A	phenol	ND

	BASE/NEUTRAL COMPOUNDS	
1B	acenaphthene	14,000
5B	benzidine	ND
8B	1,2,4-trichlorobenzene	ND
9B	hexachlorobenzene	ND
12B	hexachloroethane	ND
18B	bis(2-chloroethyl)ether	ND
20B	2-chloronaphthalene	ND
25B	1,2-dichlorobenzene	ND
26B	1,3-dichlorobenzene	ND
27B	1,4-dichlorobenzene	ND
28B	3,3-dichlorobenzidine	ND
35B	2,4-dinitrotoluene	ND
36B	2,6-dinitrotoluene	ND
37B	1,2-diphenylhydrazine	ND
39B	fluoranthene	32,000
40B	4-chlorophenyl phenyl ether	ND
41B	4-bromophenyl phenyl ether	ND
42B	bis(2-chloroisopropyl)ether	ND
43B	bis(2-chloroethoxy)methane	ND
52B	hexachlorobutadiene	ND
53B	hexachlorocyclopentadiene	ND
54B	isophorone	ND
55B	naphthalene	<5,200
56B	nitrobenzene	ND
61B	N-nitrosodimethylamine	ND
62B	N-nitrosodiphenylamine	ND
63B	N-nitrosodi-n-propylamine	ND
66B	bis(2-ethylhexyl)phthalate	ND
67B	butyl benzyl phthalate	ND
68B	di-n-butylphthalate	ND
69B	di-n-octylphthalate	ND
70B	diethyl phthalate	ND
71B	dimethyl phthalate	ND
72B	benzo(a)anthracene	160,000
73B	benzo(a)pyrene	54,000
74B	3,4-benzofluoranthene**	28,000
75B	benzo(k)fluoranthene **	
76B	chrysene	290,000
77B	acenaphthylene	*3,600
78B	anthracene	42,000
79B	benzo(ghi)perylene	27,000
80B	fluorene	42,000
81B	phenanthrene	280,000
82B	dibenzo(a,h)anthracene	17,000
83B	ideno(1,2,3-cd)pyrene	<5,200
84B	pyrene	240,000
129B	2,3,7,8-tetrachlorodibenzo-p-dioxin	ND

ND = None detected above the average reporting limit of 610 ppb for acids and 26,000 ppb for B/N.

Reported by: _____
Checked by: _____

*Trace concentrations detected below the PNA reporting limit of 5,200 ppb.

**Coelution

Additional Appendix VIII Compounds for Petroleum Refinery Industry[ab]

CLIENT ID: Filter Cake Sludge

ERCO ID: 17508

Results in: µg/kg (ppb) dry weight

Benzenethiol	ND
Indene	ND
Quinoline	ND
1-Methylnaphthalene	81,000
Dibenz(a,h)acridine[c]	ND

[a]Benz(j)fluoranthene, 7,12-dimethylbenz(a)anthracene are not reported due to lack of reference standard.

[b]Pyridine is too volatile for semivolatile analysis.

[c]Standard not available, response factor of isomeric dibenz(a,j)acridine used.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS 21 (Rock Island Refinery)

CLIENT ID: Filter Cake Sludge

ERCO ID: 17508

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
4 Hydroxy-4-methyl-2-pentanone (aldol condensation product)	ACID	311	110,000
Undecane	ACID	612	960
Dodecane and C_2-Phenol isomer	ACID	712	2,100
C_3-Phenol isomer	ACID	772	820
Methyl-Benzoic Acid isomer	ACID	779	1,400
C_2-Benzoic Acid isomer	ACID	841	670
C_3-Benzoic Acid isomer	ACID	850	1,100
C_3-Benzoic Acid isomer	ACID	871	5,900
Hydrocarbon and C_3-Naphthalene isomer	ACID	998	590
Unknown	ACID	1158	1,300

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS-21 (Rock Island Refinery)

CLIENT ID: Filter Cake Sludge

ERCO ID: 17508

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
C_1-Fluorene isomer	BN	1123	170,000
C_2-Fluorene isomer	BN	1205	150,000
C_1-Phenanthrene/anthracene isomer	BN	1259	1,100,000
C_1-Phenanthrene/anthracene isomer	BN	1275	770,000
C_2-Phenanthrene/anthracene isomer	BN	1348	1,800,000
C_3-Phenanthrene/anthracene isomer	BN	1398	780,000
C_3-Phenanthrene/anthracene isomer	BN	1420	620,000
C_1-Pyrene isomer	BN	1482	710,000
C_1-Pyrene isomer	BN	1488	410,000
C_2-Pyrene isomer	BN	1547	980,000

RESULTS OF TOTAL ANALYSIS (µg/g wet wt.)

Sample ID: Filter Cake Sludge
ERCO ID: 17508

EP-Toxicity Metals

As	10
Ba	200
Cd	0.80
Cr	510
Pb	54
Hg	0.60
Se	<2.5
Ag	<0.50

Additional Priority Pollutant Metals

Sb	<2.5
Be	<0.50
Cu	80
Ni	24
Tl	<2.5
Zn	430

Additional Metals

Ca	102,000
Fe	6,840
Mn	120
Na	16,000
V	50

Other Parameters

Total-CN	0.339
Cl-Amen-CN	0.267
TOC	150,000
Oil & Grease	195,000
Sulfide	<3.9

% Solids 74.9

RESULTS OF EP-TOXICITY LEACHATE ANALYSIS (mg/l)

Sample ID: Filter Cake
ERCO ID: 17508

is this really oily waste EP???

EP-Toxicity Metals

As	<0.14
Ba	1.3
Cd	<0.046
Cr	0.36
Pb	<0.46
Hg	<0.0047
Se	<0.14
Ag	<0.024
Cr^{+6}	

Additional Priority Pollutant Metals

Sb	--
Be	<0.017
Cu	0.58
Ni	0.21
Tl	--
Zn	0.97

Additional Metals

Ca	1,540
Fe	3.5
Mn	1.8
Na	35
V	.12

EP Extraction Data

Initial pH
Final pH
Acetic acid

CLIENT: HWMSS-21 (Rock Island Refinery)

SAMPLE RECEIVED: 7/1/85

ANALYSIS COMPLETED: 12/19/85

RESULTS IN: µg/g (ppm) dry wt.

REPORTED BY:

CHECKED BY:

ENSECO INCORPORATED

PESTICIDE ANALYSIS

- Data Report -

	Compound	Client ID: / ERCO ID:	Filter Cake Sludge 17508
89P	aldrin		ND
90P	dieldrin		ND
91P	chlordane		ND
92P	4,4'-DDT		ND
93P	4,4'-DDE		ND
94P	4,4'-DDD		ND
95P	alpha-endosulfan		ND
96P	beta-endosulfan		ND
97P	endosulfan sulfate		ND
98P	endrin		ND
99P	endrin aldehyde		ND
100P	heptachlor		ND
101P	heptachlor epoxide		ND
102P	alpha-BHC		ND
103P	beta-BHC		ND
104P	gamma-BHC		ND
105P	delta-BHC		ND
106P	PCB-1242		ND
107P	PCB-1254		ND
108P	PCB-1221		ND
109P	PCB-1232		ND
110P	PCB-1248		ND
111P	PCB-1260		ND
112P	PCB-1016		ND
113P	toxaphene		ND

ND = Not detected at or above reporting limit of 0.4 ppm.

APPENDIX A.2

- West Separators #1 and #2 -

Date Sampled: 6/24/85
Analysis Completed: 7/5/85
All Results in: ng/g (ppb)
Reported by:
Checked by:
Client: HWMSS 21 Rock Island Refinery

ERCO / A Division of ENSECO
VOLATILE ORGANICS ANALYSIS
BY EPA METHOD 624
- Data Report -

Compounds	Minimum Reporting Limit	Client ID: West Separator Sample 1 ERCO ID: 17509
Chloromethane	2,000	ND
Bromomethane	2,000	ND
Vinyl chloride	2,000	ND
Chloroethane	2,000	ND
Methylene chloride	2,000	3,800
Acetone	20,000	ND
Carbon disulfide	400	ND
1,1-dichloroethene	400	ND
1,1-dichloroethane	400	ND
Trans-1,2-dichloroethene	400	ND
Chloroform	400	12,000
1,2-dichloroethane	400	ND
2-Butanone	4,000	ND
1,1,1-trichloroethane	400	ND
Carbon tetrachloride	400	ND
Vinyl acetate	400	ND
Bromodichloromethane	400	ND
1,2-dichloropropane	400	ND
Trans-1,3-dichloropropene	400	ND
Trichloroethene	400	ND
Dibromochloromethane	400	ND
1,1,2-trichloroethane	400	ND
Benzene	400	290,000
Cis-1,3-dichloropropene	400	ND
2-Chloroethylvinylether	400	ND
Bromoform	400	ND
2-Hexanone	4,000	ND
4-Methyl-2-pentanone	4,000	ND
Tetrachloroethene	400	9,100
1,1,2,2-Tetrachloroethane	400	ND
Toluene	400	1,500,000
Chlorobenzene	400	ND
Ethylbenzene	400	280,000
Styrene	400	ND
Total xylenes	400	1,900,000

ND = Not detected.
Unknowns present - see attached sheet.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS 21

CLIENT ID: West Separator Sample 1

ERCO ID: 17509

CAS NUMBER	COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
103651	Benzene, propyl	VOA	1387	200,000
611143	Benzene, 1 ethyl-2-methyl	VOA	1564	400,000
110543	Hexane	VOA	743	400,000
96377	Cyclopentane	VOA	578	200,000
589344	Hexane, 3-methyl	VOA	868	500,000

CLIENT: HWMSS-21 (Rock Island Refinery)
CLIENT ID: West Separator Sample #1
ERCO ID: 17509
SAMPLE RECEIVED: 7/2/85
ANALYSIS COMPLETED: 8/21/85
RESULTS IN: µg/kg (ppb) dry weight

ERCO / A Division of ENSECO

SUMMARY OF
ORGANIC PRIORITY POLLUTANT ANALYSIS

	ACID COMPOUNDS	
21A	2,4,6-trichlorophenol	ND
22A	p-chloro-m-cresol	ND
24A	2-chlorophenol	ND
31A	2,4-dichlorophenol	ND
34A	2,4-dimethylphenol	12,000
57A	2-nitrophenol	ND
58A	4-nitrophenol	ND
59A	2,4-dinitrophenol	ND
60A	4,6-dinitro-o-cresol	ND
64A	pentachlorophenol	ND
65A	phenol	3,800

	BASE/NEUTRAL COMPOUNDS	
1B	acenaphthene	80,000
5B	benzidine	ND
8B	1,2,4-trichlorobenzene	ND
9B	hexachlorobenzene	ND
12B	hexachloroethane	ND
18B	bis(2-chloroethyl)ether	ND
20B	2-chloronaphthalene	ND
25B	1,2-dichlorobenzene	ND
26B	1,3-dichlorobenzene	ND
27B	1,4-dichlorobenzene	ND
28B	3,3-dichlorobenzidine	ND
35B	2,4-dinitrotoluene	ND
36B	2,6-dinitrotoluene	ND
37B	1,2-diphenylhydrazine	ND
39B	fluoranthene	210,000
40B	4-chlorophenyl phenyl ether	ND
41B	4-bromophenyl phenyl ether	ND
42B	bis(2-chloroisopropyl)ether	ND
43B	bis(2-chloroethoxy)methane	ND
52B	hexachlorobutadiene	ND
53B	hexachlorocyclopentadiene	ND
54B	isophorone	ND
55B	naphthalene	410,000
56B	nitrobenzene	ND
61B	N-nitrosodimethylamine	ND
62B	N-nitrosodiphenylamine	ND
63B	N-nitrosodi-n-propylamine	ND
66B	bis(2-ethylhexyl)phthalate	ND
67B	butyl benzyl phthalate	ND
68B	di-n-butylphthalate	ND
69B	di-n-octylphthalate	ND
70B	diethyl phthalate	ND
71B	dimethyl phthalate	ND
72B	benzo(a)anthracene	220,000
73B	benzo(a)pyrene	120,000
74B	3,4-benzofluoranthene	<76,000
75B	benzo(k)fluoranthene	<76,000
76B	chrysene	540,000
77B	acenaphthylene	<76,000
78B	anthracene	390,000
79B	benzo(ghi)perylene	<76,000
80B	fluorene	280,000
81B	phenanthrene	<76,000
82B	dibenzo(a,h)anthracene	2,200,000
83B	ideno(1,2,3-cd)pyrene	<76,000
84B	pyrene	950,000
129B	2,3,7,8-tetrachlorodibenzo-p-dioxin	ND

ND = None detected above the average reporting limit of 1,200 ppb for acids and 380,000 ppb for B/N.

Reported by: _____
Checked by: _____

*Trace concentrations detected below the PNA reporting limit of 76,000 ppb.

Additional Appendix VIII Compounds for Petroleum Refinery Industry[a,b]

CLIENT ID: West Separator Sample #1

ERCO ID: 17509

Results in: µg/kg (ppb) dry weight

Benzenethiol	ND
Indene	ND
Quinoline	ND
1-Methylnaphthalene	810,000
Dibenz(a,h)acridine[c]	ND

[a]Benz(j)fluoranthene, 7,12-dimethylbenz(a)anthracene are not reported due to lack of reference standard.

[b]Pyridine is too volatile for semivolatile analysis.

[c]Standard not available, response factor of isomeric dibenz(a,j)acridine used.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS-21 (Rock Island Refinery)

CLIENT ID: West Separator Sample #1

ERCO ID: 17509

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
C_1-Phenanthrene/anthracene isomer	BN	1251	4,400,000
C_1-Phenanthrene/anthracene isomer	BN	1256	5,400,000
C_1-Phenanthrene/anthracene isomer	BN	1268	6,900,000
C_2-Dibenzothiophene isomer	BN	1303	2,400,000
C_2-Phenanthrene/anthracene isomer	BN	1329	4,600,000
C_2-Phenanthrene/anthracene isomer	BN	1343	12,000,000
C_2-Phenanthrene/anthracene isomer	BN	1353	2,600,000
C_3-Phenanthrene/anthracene isomer	BN	1395	2,500,000
C_1-Pyrene isomer	BN	1475	2,300,000
C_2-Pyrene isomer	BN	1537	2,200,000

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS-21 (Rock Island Refinery)

CLIENT ID: West Separator Sample 1

ERCO ID: 17509

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
Undecane	ACID	604	3,600
C_2-Phenol isomer and Dodecane	ACID	705	7,400
C_3-Phenol isomer	ACID	737	5,200
C_3-Phenol isomer	ACID	766	6,500
Tridecane and C_4-Phenol isomer	ACID	797	6,900
Tetradecane	ACID	883	11,000
Hydrocarbon and C_3-Naphthalene isomer	ACID	1004	4,900
Dodecanoic acid	ACID	1040	25,000
Tridecanoic acid	ACID	1114	20,000
Tetradecanoic acid	ACID	1180	15,000
Nonadecane and C_1-Phenanthrene/anthracene isomer	ACID	1249	7,400

RESULTS OF TOTAL ANALYSIS (µg/g wet wt.)

Sample ID: West Separator Sample #1
ERCO ID: 17509

EP-Toxicity Metals

As	5.1
Ba	55
Cd	0.93
Cr	350
Pb	43
Hg	0.54
Se	<2.5
Ag	<0.49

Additional Priority Pollutant Metals

Sb	<2.5
Be	<0.49
Cu	40
Ni	15
Tl	<2.5
Zn	270

Additional Metals

Ca	42,200
Fe	3,980
Mn	64
Na	2,960
V	16

Other Parameters

Total-CN	<0.758
Cl-Amen-CN	NA
TOC	781,000
Oil & Grease	NA
Sulfide	13

% Solids	NA

NA = Not applicable.

RESULTS OF EP-TOXICITY LEACHATE ANALYSIS (mg/l)

Sample ID: West Separator Sample 1
ERCO ID: 17509

EP-Toxicity Metals

As	<0.19
Ba	0.80
Cd	<0.056
Cr	0.22
Pb	0.37
Hg	0.0041
Se	<0.19
Ag	<0.027
Cr^{+6}	

Additional Priority Pollutant Metals

Sb	--
Be	<0.014
Cu	<0.28
Ni	0.21
Tl	--
Zn	5.7

Additional Metals

Ca	454
Fe	3.6
Mn	1.1
Na	28
V	<0.14

EP Extraction Data

Initial pH
Final pH
Acetic acid

CLIENT: HWMSS-21 (Rock Island Refinery)

SAMPLE RECEIVED: 7/1/85

ANALYSIS COMPLETED: 12/19/85

RESULTS IN: µg/g (ppm) dry wt.

REPORTED BY:

CHECKED BY:

ENSECO INCORPORATED

PESTICIDE ANALYSIS

- Data Report -

Compound	Client ID: West Separator Sample #1 ERCO ID: 17509
89P aldrin	ND
90P dieldrin	ND
91P chlordane	ND
92P 4,4'-DDT	ND
93P 4,4'-DDE	ND
94P 4,4'-DDD	ND
95P alpha-endosulfan	ND
96P beta-endosulfan	ND
97P endosulfan sulfate	ND
98P endrin	ND
99P endrin aldehyde	ND
100P heptachlor	ND
101P heptachlor epoxide	ND
102P alpha-BHC	ND
103P beta-BHC	ND
104P gamma-BHC	ND
105P delta-BHC	ND
106P PCB-1242	ND
107P PCB-1254	ND
108P PCB-1221	ND
109P PCB-1232	ND
110P PCB-1248	ND
111P PCB-1260	ND
112P PCB-1016	ND
113P toxaphene	ND

ND = Not detected at or above reporting limit of 8.0 ppm.

Date Sampled: 6/24/85
Analysis Completed: 7/5/85
All Results in: ng/g (ppb)
Reported by:
Checked by:
Client: HWMSS 21 Rock Island Refinery

ERCO / A Division of ENSECO
VOLATILE ORGANICS ANALYSIS
BY EPA METHOD 624
- Data Report -

Compounds	Minimum Reporting Limit	Client ID: West Separator Sample 2 ERCO ID: 17510
Chloromethane	1,800	ND
Bromomethane	1,800	ND
Vinyl chloride	1,800	ND
Chloroethane	1,800	ND
Methylene chloride	1,800	2,600
Acetone	18,000	ND
Carbon disulfide	360	ND
1,1-dichloroethene	360	ND
1,1-dichloroethane	360	ND
Trans-1,2-dichloroethene	360	ND
Chloroform	360	6,700
1,2-dichloroethane	360	ND
2-Butanone	3,600	15,000
1,1,1-trichloroethane	360	ND
Carbon tetrachloride	360	ND
Vinyl acetate	360	ND
Bromodichloromethane	360	ND
1,2-dichloropropane	360	ND
Trans-1,3-dichloropropene	360	ND
Trichloroethene	360	ND
Dibromochloromethane	360	ND
1,1,2-trichloroethane	360	ND
Benzene	360	ND
Cis-1,3-dichloropropene	360	ND
2-Chloroethylvinylether	360	ND
Bromoform	360	ND
2-Hexanone	3,600	ND
4-Methyl-2-pentanone	3,600	ND
Tetrachloroethene	360	ND
1,1,2,2-Tetrachloroethane	360	ND
Toluene	360	7,600
Chlorobenzene	360	ND
Ethylbenzene	360	ND
Styrene	360	ND
Total xylenes	360	ND

ND = Not detected.
No unknowns.

CLIENT: HWMSS-21 (Rock Island Refinery)
CLIENT ID: West Separator Sample #2
ERCO ID: 17510
SAMPLE RECEIVED: 7/2/85
ANALYSIS COMPLETED: 8/22/85
RESULTS IN: µg/kg (ppb) dry weight

ERCO / A Division of ENSECO

SUMMARY OF
ORGANIC PRIORITY POLLUTANT ANALYSIS

	ACID COMPOUNDS	
21A	2,4,6-trichlorophenol	ND
22A	p-chloro-m-cresol	ND
24A	2-chlorophenol	ND
31A	2,4-dichlorophenol	ND
34A	2,4-dimethylphenol	ND
57A	2-nitrophenol	ND
58A	4-nitrophenol	ND
59A	2,4-dinitrophenol	ND
60A	4,6-dinitro-o-cresol	ND
64A	pentachlorophenol	ND
65A	phenol	ND

	BASE/NEUTRAL COMPOUNDS	
1B	acenaphthene	31,000
5B	benzidine	ND
8B	1,2,4-trichlorobenzene	ND
9B	hexachlorobenzene	ND
12B	hexachloroethane	ND
18B	bis(2-chloroethyl)ether	ND
20B	2-chloronaphthalene	ND
25B	1,2-dichlorobenzene	ND
26B	1,3-dichlorobenzene	ND
27B	1,4-dichlorobenzene	ND
28B	3,3-dichlorobenzidine	ND
35B	2,4-dinitrotoluene	ND
36B	2,6-dinitrotoluene	ND
37B	1,2-diphenylhydrazine	ND
39B	fluoranthene	120,000
40B	4-chlorophenyl phenyl ether	ND
41B	4-bromophenyl phenyl ether	ND
42B	bis(2-chloroisopropyl)ether	ND
43B	bis(2-chloroethoxy)methane	ND
52B	hexachlorobutadiene	ND
53B	hexachlorocyclopentadiene	ND
54B	isophorone	ND
55B	naphthalene	170,000
56B	nitrobenzene	ND
61B	N-nitrosodimethylamine	ND
62B	N-nitrosodiphenylamine	ND
63B	N-nitrosodi-n-propylamine	ND
66B	bis(2-ethylhexyl)phthalate	ND
67B	butyl benzyl phthalate	ND
68B	di-n-butylphthalate	ND
69B	di-n-octylphthalate	ND
70B	diethyl phthalate	ND
71B	dimethyl phthalate	ND
72B	benzo(a)anthracene	440,000
73B	benzo(a)pyrene	250,000
74B	3,4-benzofluoranthene**	110,000
75B	benzo(k)fluoranthene **	
76B	chrysene	820,000
77B	acenaphthylene	<15,600
78B	anthracene	140,000
79B	benzo(ghi)perylene	110,000
80B	fluorene	82,000
81B	phenanthrene	670,000
82B	dibenzo(a,h)anthracene	58,000
83B	ideno(1,2,3-cd)pyrene	<15,600
84B	pyrene	550,000
129B	2,3,7,8-tetrachlorodibenzo-p-dioxin	ND

ND = None detected above the average reporting limit of 20,000 ppb for acids and 78,000 ppb for B/N.

Reported by: _____
Checked by: _____

*Trace concentrations detected below the PNA reporting limit of 15,600 ppb.

**Coelution

Additional Appendix VIII Compounds for Petroleum Refinery Industry[a,b]

CLIENT ID: West Separator Sample #2

ERCO ID: 17510

Results in: µg/kg (ppb) dry weight

Benzenethiol	ND
Indene	ND
Quinoline	ND
1-Methylnaphthalene	300,000
Dibenz(a,h)acridine[c]	ND

[a]Benz(j)fluoranthene, 7,12-dimethylbenz(a)anthracene are not reported due to lack of reference standard.

[b]Pyridine is too volatile for semivolatile analysis.

[c]Standard not available, response factor of isomeric dibenz(a,j)acridine used.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS-21 (Rock Island Refinery)

CLIENT ID: West Separator Sample #2

ERCO ID: 17510

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
Tetradecane	ACID	884	250,000
Pentadecane & C_3-Naphthalene isomer	ACID	965	160,000
Hexadecane	ACID	1041	270,000
Nonadecane and C_1-phenanthrene/anthracene isomer	ACID	1250	460,000
Eicosane	ACID	1314	210,000
Heneicosane	ACID	1375	280,000
Docosane	ACID	1434	320,900
C_1-Pyrene isomer	ACID	1476	270,000
Tricosane	ACID	1490	250,000

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS-21 (Rock Island Refinery)

CLIENT ID: West Separator Sample #2

ERCO ID: 17510

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
C_1-Phenanthrene/anthracene isomer	BN	1253	1,300,000
C_1-Phenanthrene/anthracene isomer	BN	1270	1,500,000
C_2-Phenanthrene/anthracene isomer	BN	1344	3,200,000
C_3-Phenanthrene/anthracene isomer	BN	1417	1,200,000
C_1-Pyrene isomer	BN	1465	1,300,000
C_1-Pyrene isomer	BN	1480	1,700,000
C_2-Pyrene isomer	BN	1534	1,800,000
C_2-Pyrene isomer	BN	1549	2,400,000
Polynuclear aromatic, $C_{18}H_{12}$ isomer	BN	1591	3,000,000
C_1-Pyrene isomer	BN	1653	2,800,000

RESULTS OF TOTAL ANALYSIS (µg/g wet wt.)

Sample ID: West Separator Sample #2
ERCO ID: 17510

EP-Toxicity Metals

As	2.3
Ba	13
Cd	0.47
Cr	73
Pb	10
Hg	0.079
Se	<2.3
Ag	<0.47

Additional Priority Pollutant Metals

Sb	<2.3
Be	<0.47
Cu	6.6
Ni	2.7
Tl	<2.3
Zn	52

Additional Metals

Ca	9,390
Fe	740
Mn	15
Na	1,970
V	<4.7

Other Parameters

Total-CN	<0.298
Cl-Amen-CN	NA
TOC	
Oil & Grease	NA
Sulfide	7.0

% Solids NA

NA = Not applicable.

RESULTS OF EP-TOXICITY LEACHATE ANALYSIS (mg/l)

Sample ID: West Separator Sample 2
ERCO ID: 17510

EP-Toxicity Metals

As	<0.22
Ba	0.94
Cd	<0.15
Cr	0.18
Pb	0.34 + [1.2]*
Hg	0.0071
Se	<0.23
Ag	<0.076
Cr^{+6}	

Additional Priority Pollutant Metals

Sb	--
Be	<0.039
Cu	<0.77
Ni	0.41
Tl	--
Zn	2.6

Additional Metals

Ca	210
Fe	4.2
Mn	0.47
Na	106
V	0.087

EP Extraction Data

Initial pH
Final pH
Acetic acid

*Additional concentration of mobile metal if metal concentration was present just below the detection limit.

CLIENT: HWMSS-21 (Rock Island Refinery)

SAMPLE RECEIVED: 7/1/85

ANALYSIS COMPLETED: 12/19/85

RESULTS IN: µg/g (ppm) dry wt.

REPORTED BY:

CHECKED BY:

ENSECO INCORPORATED

PESTICIDE ANALYSIS

- Data Report -

	Compound	Client ID: West Separator Sample #2 ERCO ID: 17510
89P	aldrin	ND
90P	dieldrin	ND
91P	chlordane	ND
92P	4,4'-DDT	ND
93P	4,4'-DDE	ND
94P	4,4'-DDD	ND
95P	alpha-endosulfan	ND
96P	beta-endosulfan	ND
97P	endosulfan sulfate	ND
98P	endrin	ND
99P	endrin aldehyde	ND
100P	heptachlor	ND
101P	heptachlor epoxide	ND
102P	alpha-BHC	ND
103P	beta-BHC	ND
104P	gamma-BHC	ND
105P	delta-BHC	ND
106P	PCB-1242	ND
107P	PCB-1254	ND
108P	PCB-1221	ND
109P	PCB-1232	ND
110P	PCB-1248	ND
111P	PCB-1260	ND
112P	PCB-1016	ND
113P	toxaphene	ND

ND = Not detected at or above reporting limit of 3.0 ppm.

APPENDIX A.3

- Holding Tanks -

Date Sampled: 6/24/85
Analysis Completed: 7/7/85
All Results in: ng/g (ppb)
Reported by:
Checked by:
Client: HWMSS 21 Rock Island Refinery

ERCO / A Division of ENSECO
VOLATILE ORGANICS ANALYSIS
BY EPA METHOD 624
- Data Report -

Compounds	Minimum Reporting Limit	Client ID: ERCO ID:	Holding Tank Sample 1 17511 Oil Phase
Chloromethane	25,000		ND
Bromomethane	25,000		ND
Vinyl chloride	25,000		ND
Chloroethane	25,000		ND
Methylene chloride	25,000		41,000
Acetone	250,000		ND
Carbon disulfide	5,000		ND
1,1-dichloroethene	5,000		ND
1,1-dichloroethane	5,000		ND
Trans-1,2-dichloroethene	5,000		ND
Chloroform	5,000		110,000
1,2-dichloroethane	5,000		ND
2-Butanone	50,000		370,000
1,1,1-trichloroethane	5,000		ND
Carbon tetrachloride	5,000		ND
Vinyl acetate	5,000		ND
Bromodichloromethane	5,000		ND
1,2-dichloropropane	5,000		ND
Trans-1,3-dichloropropene	5,000		ND
Trichloroethene	5,000		ND
Dibromochloromethane	5,000		ND
1,1,2-trichloroethane	5,000		ND
Benzene	5,000		85,000
Cis-1,3-dichloropropene	5,000		ND
2-Chloroethylvinylether	5,000		ND
Bromoform	5,000		ND
2-Hexanone	50,000		ND
4-Methyl-2-pentanone	50,000		ND
Tetrachloroethene	5,000		ND
1,1,2,2-Tetrachloroethane	5,000		ND
Toluene	5,000		770,000
Chlorobenzene	5,000		ND
Ethylbenzene	5,000		420,000
Styrene	5,000		ND
Total xylenes	5,000		2,500,000

ND = Not detected.
Unknowns present - see attached sheet.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS 21

CLIENT ID: Holding Tank Sample 1

ERCO ID: 17511 Oil

CAS NUMBER	COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
	Alkyl benzene	VOA	786	500,000
	Alkane, Alkene or Cycloalkane	VOA	913	500,000
	Alkyl benzene	VOA	977	750,000
	Alkane, Alkene or Cycloalkane	VOA	1173	1,000,000
611143	Benzene, ethyl methyl	VOA	1569	1,000,000

CLIENT: HWMSS-21 (Rock Island Refinery)
CLIENT ID: Holding Tank Sample #1 (Oil Layer)
ERCO ID: 17511A
SAMPLE RECEIVED: 7/2/85
ANALYSIS COMPLETED: 8/22/85
RESULTS IN: µg/l (ppb)

ERCO / A Division of ENSECO

SUMMARY OF
ORGANIC PRIORITY POLLUTANT ANALYSIS

	ACID COMPOUNDS	
21A	2,4,6-trichlorophenol	ND
22A	p-chloro-m-cresol	ND
24A	2-chlorophenol	ND
31A	2,4-dichlorophenol	ND
34A	2,4-dimethylphenol	ND
57A	2-nitrophenol	ND
58A	4-nitrophenol	ND
59A	2,4-dinitrophenol	ND
60A	4,6-dinitro-o-cresol	ND
64A	pentachlorophenol	ND
65A	phenol	ND

	BASE/NEUTRAL COMPOUNDS	
1B	acenaphthene	72,000
5B	benzidine	ND
8B	1,2,4-trichlorobenzene	ND
9B	hexachlorobenzene	ND
12B	hexachloroethane	ND
18B	bis(2-chloroethyl)ether	ND
20B	2-chloronaphthalene	ND
25B	1,2-dichlorobenzene	ND
26B	1,3-dichlorobenzene	ND
27B	1,4-dichlorobenzene	ND
28B	3,3-dichlorobenzidine	ND
35B	2,4-dinitrotoluene	ND
36B	2,6-dinitrotoluene	ND
37B	1,2-diphenylhydrazine	ND
39B	fluoranthene	120,000
40B	4-chlorophenyl phenyl ether	ND
41B	4-bromophenyl phenyl ether	ND
42B	bis(2-chloroisopropyl)ether	ND
43B	bis(2-chloroethoxy)methane	ND
52B	hexachlorobutadiene	ND
53B	hexachlorocyclopentadiene	ND
54B	isophorone	ND
55B	naphthalene	440,000
56B	nitrobenzene	ND
61B	N-nitrosodimethylamine	ND
62B	N-nitrosodiphenylamine	ND
63B	N-nitrosodi-n-propylamine	ND
66B	bis(2-ethylhexyl)phthalate	ND
67B	butyl benzyl phthalate	ND
68B	di-n-butylphthalate	ND
69B	di-n-octylphthalate	ND
70B	diethyl phthalate	ND
71B	dimethyl phthalate	ND
72B	benzo(a)anthracene	220,000
73B	benzo(a)pyrene	100,000
74B	3,4-benzofluoranthene**	56,000
75B	benzo(k)fluoranthene **	
76B	chrysene	400,000
77B	acenaphthylene	<40,000
78B	anthracene	120,000
79B	benzo(ghi)perylene	*30,000
80B	fluorene	94,000
81B	phenanthrene	610,000
82B	dibenzo(a,h)anthracene	<40,000
83B	ideno(1,2,3-cd)pyrene	<40,000
84B	pyrene	300,000
129B	2,3,7,8-tetrachlorodibenzo-p-dioxin	ND

ND = None detected above the average reporting limit of 10,000 ppb for acids and 200,000 ppb for B/N.

Reported by: _____
Checked by: _____

*Trace concentrations detected below the PNA reporting limit of 40,000 ppb.

**Coelution

Additional Appendix VIII Compounds for Petroleum Refinery Industry[a,b]

CLIENT ID: Holding Tank Sample #1 (Oil Layer)

ERCO ID: 17511A

Results in: µg/l (ppb)

Benzenethiol	ND
Indene	100,000
Quinoline	ND
1-Methylnaphthalene	920,000
Dibenz(a,h)acridine[c]	ND

[a]Benz(j)fluoranthene, 7,12-dimethylbenz(a)anthracene are not reported due to lack of reference standard.

[b]Pyridine is too volatile for semivolatile analysis.

[c]Standard not available, response factor of isomeric dibenz(a,j)acridine used.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS-21 (Rock Island Refinery)

CLIENT ID: Holding Tank Sample #1 (Oil Layer)

ERCO ID: 17511A

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
C_3-Naphthalene isomer	BN	1004	1,000,000
C_4-Naphthalene isomer and C_1-Biphenyl isomer	BN	1040	1,600,000
C_2-Biphenyl isomer	BN	1128	1,100,000
C_1-Phenanthrene/anthracene isomer	BN	1250	1,400,000
C_1-Phenanthrene/anthracene isomer	BN	1254	1,000,000
C_1-Phenanthrene/anthracene isomer	BN	1267	1,600,000
C_2-Phenanthrene/anthracene isomer	BN	1339	3,600,000
C_3-Phenanthrene/anthracene isomer	BN	1412	1,000,000
C_1-Pyrene isomer	BN	1472	1,000,000
P_2-Pyrene isomer	BN	1540	1,600,000
C_1-Chrysene isomer	BN	1643	1,200,000

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS-21 (Rock Island Refinery)

CLIENT ID: Holding Tank Sample #1 (Oil Layer)

ERCO ID: 17511A

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
No unknown	ACID		

RESULTS OF TOTAL ANALYSIS (µg/g wet wt.)

Sample ID: Holding Tank Sample #1
ERCO ID: 17511A (Oil layer)

EP-Toxicity Metals

As	<2.5
Ba	19
Cd	<0.49
Cr	58
Pb	11
Hg	<0.079
Se	<2.5
Ag	<0.49

Additional Priority Pollutant Metals

Sb	<2.5
Be	0.49
Cu	11
Ni	4.2
Tl	<2.5
Zn	44

Additional Metals

Ca	11,300
Fe	540
Mn	12
Na	3,090
V	<4.9

Other Parameters

Total-CN	<0.094
Cl-Amen-CN	NA
TOC	374,000
Oil & Grease	NA
Sulfide	<1.1

% Solids NA

NA = Not applicable.

CLIENT: HWMSS-21 (Rock Island Refinery)

SAMPLE RECEIVED: 7/1/85

ANALYSIS COMPLETED: 12/19/85

RESULTS IN: µg/g (ppm) dry wt.

REPORTED BY:

CHECKED BY:

ENSECO INCORPORATED

PESTICIDE ANALYSIS

- Data Report -

Compound	Client ID: Holding Tank Sample #1 ERCO ID: 17511 A (Oil layer)
89P aldrin	ND
90P dieldrin	ND
91P chlordane	ND
92P 4,4'-DDT	ND
93P 4,4'-DDE	ND
94P 4,4'-DDD	ND
95P alpha-endosulfan	ND
96P beta-endosulfan	ND
97P endosulfan sulfate	ND
98P endrin	ND
99P endrin aldehyde	ND
100P heptachlor	ND
101P heptachlor epoxide	ND
102P alpha-BHC	ND
103P beta-BHC	ND
104P gamma-BHC	ND
105P delta-BHC	ND
106P PCB-1242	ND
107P PCB-1254	ND
108P PCB-1221	ND
109P PCB-1232	ND
110P PCB-1248	ND
111P PCB-1260	ND
112P PCB-1016	ND
113P toxaphene	ND

ND = Not detected at or above reporting limit of 5.0 ppm.

Date Sampled: 6/24/85
Analysis Completed: 7/7/85
All Results in: ng/g (ppb)
Reported by:
Checked by:
Client: HWMSS 21 Rock Island Refinery

ERCO / A Division of ENSECO
VOLATILE ORGANICS ANALYSIS
BY EPA METHOD 624
- Data Report -

Compounds	Minimum Reporting Limit	Client ID: ERCO ID:	Holding Tank Sample 2 17512 Oil Phase
Chloromethane	22,000		ND
Bromomethane	22,000		ND
Vinyl chloride	22,000		ND
Chloroethane	22,000		ND
Methylene chloride	22,000		58,000
Acetone	220,000		ND
Carbon disulfide	4,400		ND
1,1-dichloroethene	4,400		ND
1,1-dichloroethane	4,400		ND
Trans-1,2-dichloroethene	4,400		ND
Chloroform	4,400		88,000
1,2-dichloroethane	4,400		ND
2-Butanone	44,000		350,000
1,1,1-trichloroethane	4,400		ND
Carbon tetrachloride	4,400		ND
Vinyl acetate	4,400		ND
Bromodichloromethane	4,400		ND
1,2-dichloropropane	4,400		ND
Trans-1,3-dichloropropene	4,400		ND
Trichloroethene	4,400		ND
Dibromochloromethane	4,400		ND
1,1,2-trichloroethane	4,400		ND
Benzene	4,400		92,000
Cis-1,3-dichloropropene	4,400		ND
2-Chloroethylvinylether	4,400		ND
Bromoform	4,400		ND
2-Hexanone	44,000		ND
4-Methyl-2-pentanone	44,000		ND
Tetrachloroethene	4,400		ND
1,1,2,2-Tetrachloroethane	4,400		ND
Toluene	4,400		750,000
Chlorobenzene	4,400		ND
Ethylbenzene	4,400		370,000
Styrene	4,400		ND
Total xylenes	4,400		2,600,000

ND = Not detected.
Unknowns present - see attached sheet.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS 21

CLIENT ID: Holding Tank Sample 2

ERCO ID: 17512 Oil

CAS NUMBER	COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
	Aromatic hydrocarbons	VOA	913	1,000,000
	Possible aliphatic hydrocarbons	VOA	976	1,000,000
	Benzene (1-propyl-1-methyl)	VOA	1458	1,000,000
	Benzene-1-ethyl-2-methyl	VOA	1585	1,000,000

CLIENT: HWMSS-21 (Rock Island Refinery)
CLIENT ID: Holding Tank Sample #2 (Oil Layer)
ERCO ID: 17512A
SAMPLE RECEIVED: 7/2/85
ANALYSIS COMPLETED: 8/22/85
RESULTS IN: µg/l (ppb)

ERCO / A Division of ENSECO

SUMMARY OF
ORGANIC PRIORITY POLLUTANT ANALYSIS

	ACID COMPOUNDS	
21A	2,4,6-trichlorophenol	ND
22A	p-chloro-m-cresol	ND
24A	2-chlorophenol	ND
31A	2,4-dichlorophenol	ND
34A	2,4-dimethylphenol	ND
57A	2-nitrophenol	ND
58A	4-nitrophenol	ND
59A	2,4-dinitrophenol	ND
60A	4,6-dinitro-o-cresol	ND
64A	pentachlorophenol	ND
65A	phenol	ND

	BASE/NEUTRAL COMPOUNDS	
1B	acenaphthene	56,000
5B	benzidine	ND
8B	1,2,4-trichlorobenzene	ND
9B	hexachlorobenzene	ND
12B	hexachloroethane	ND
18B	bis(2-chloroethyl)ether	ND
20B	2-chloronaphthalene	ND
25B	1,2-dichlorobenzene	ND
26B	1,3-dichlorobenzene	ND
27B	1,4-dichlorobenzene	ND
28B	3,3-dichlorobenzidine	ND
35B	2,4-dinitrotoluene	ND
36B	2,6-dinitrotoluene	ND
37B	1,2-diphenylhydrazine	ND
39B	fluoranthene	130,000
40B	4-chlorophenyl phenyl ether	ND
41B	4-bromophenyl phenyl ether	ND
42B	bis(2-chloroisopropyl)ether	ND
43B	bis(2-chloroethoxy)methane	ND
52B	hexachlorobutadiene	ND
53B	hexachlorocyclopentadiene	ND
54B	isophorone	ND
55B	naphthalene	390,000
56B	nitrobenzene	ND
61B	N-nitrosodimethylamine	ND
62B	N-nitrosodiphenylamine	ND
63B	N-nitrosodi-n-propylamine	ND
66B	bis(2-ethylhexyl)phthalate	ND
67B	butyl benzyl phthalate	ND
68B	di-n-butylphthalate	ND
69B	di-n-octylphthalate	ND
70B	diethyl phthalate	ND
71B	dimethyl phthalate	ND
72B	benzo(a)anthracene	190,000
73B	benzo(a)pyrene	97,000
74B	3,4-benzofluoranthene**)	52,000
75B	benzo(k)fluoranthene **)	
76B	chrysene	380,000
77B	acenaphthylene	*24,000
78B	anthracene	100,000
79B	benzo(ghi)perylene	<40,000
80B	fluorene	90,000
81B	phenanthrene	570,000
82B	dibenzo(a,h)anthracene	<40,000
83B	ideno(1,2,3-cd)pyrene	<40,000
84B	pyrene	320,000
129B	2,3,7,8-tetrachlorodibenzo-p-dioxin	ND

ND = None detected above the average reporting limit of 10,000 ppb for acids and 200,000 ppb for B/N.

Reported by: _____
Checked by: _____

*Trace concentrations detected below the PNA reporting limit of 40,000 ppb.

**Coelution.

Additional Appendix VIII Compounds for Petroleum Refinery Industry[a,b]

CLIENT ID: Holding Tank Sample #2 (Oil Layer)

ERCO ID: 17512A

Results in: µg/l (ppb)

Benzenethiol	ND
Indene	ND
Quinoline	ND
1-Methylnaphthalene	760,000
Dibenz(a,h)acridine[c]	ND

[a]Benz(j)fluoranthene, 7,12-dimethylbenz(a)anthracene are not reported due to lack of reference standard.

[b]Pyridine is too volatile for semivolatile analysis.

[c]Standard not available, response factor of isomeric dibenz(a,j)acridine used.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS-21 (Rock Island Refinery)

CLIENT ID: Holding Tank Sample #2 (Oil Layer)

ERCO ID: 17512A

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
C_2-Naphthalene isomer	BN	888	1,200,000
C_3-Naphthalene isomer	BN	1002	760,000
C_1-Biphenyl isomer	BN	1040	1,200,000
C_1-Phenanthrene/anthracene isomer	BN	1254	2,000,000
C_1-Phenanthrene/anthracene isomer	BN	1267	1,300,000
C_2-Phenanthrene/anthracene isomer	BN	1328	1,300,000
C_3-Phenanthrene/anthracene	BN	1395	680,000
C_3-Phenanthrene/anthracene isomer	BN	1413	850,000
C_1-Pyrene isomer	BN	1474	820,000
C_2-Chrysene isomer	BN	1644	890,000

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS-21 (Rock Island Refinery)

CLIENT ID: Holding Tank Sample #2 (Oil Layer)

ERCO ID: 17512A

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
No unknowns	ACID		

RESULTS OF TOTAL ANALYSIS (µg/g wet wt.)

Sample ID: Holding Tank Sample #2
ERCO ID: 17512A (Oil layer)

EP-Toxicity Metals

As	<2.5
Ba	17
Cd	<0.50
Cr	56
Pb	11
Hg	<0.060
Se	<2.5
Ag	<0.50

Additional Priority Pollutant Metals

Sb	<2.5
Be	<0.50
Cu	4.3
Ni	3.0
Tl	<2.5
Zn	42

Additional Metals

Ca	11,400
Fe	480
Mn	12
Na	2,060
V	<5.0

Other Parameters

Total-CN	<0.130
Cl-Amen-CN	NA
TOC	489,000
Oil & Grease	NA
Sulfide	<3.5

% Solids NA

NA = Not applicable.

CLIENT: HWMSS-21 (Rock Island Refinery)

SAMPLE RECEIVED: 7/1/85

ANALYSIS COMPLETED: 12/19/85

RESULTS IN: µg/g (ppm)

REPORTED BY:

CHECKED BY:

ENSECO INCORPORATED

PESTICIDE ANALYSIS

- Data Report -

Compound	Client ID: Holding Tank Sample #1 ERCO ID: 17511A (Oil layer)
89P aldrin	ND
90P dieldrin	ND
91P chlordane	ND
92P 4,4'-DDT	ND
93P 4,4'-DDE	ND
94P 4,4'-DDD	ND
95P alpha-endosulfan	ND
96P beta-endosulfan	ND
97P endosulfan sulfate	ND
98P endrin	ND
99P endrin aldehyde	ND
100P heptachlor	ND
101P heptachlor epoxide	ND
102P alpha-BHC	ND
103P beta-BHC	ND
104P gamma-BHC	ND
105P delta-BHC	ND
106P PCB-1242	ND
107P PCB-1254	ND
108P PCB-1221	ND
109P PCB-1232	ND
110P PCB-1248	ND
111P PCB-1260	ND
112P PCB-1016	ND
113P toxaphene	ND

ND = Not detected at or above reporting limit of 5.0 ppm.

Date Sampled: 6/24/85

Analysis Completed: 7/7/85

All Results in: ng/g (ppb)

Reported by:

Checked by:

Client: HWMSS 21 Rock Island Refinery

ERCO / A Division of ENSECO

VOLATILE ORGANICS ANALYSIS

BY EPA METHOD 624

- Data Report -

Compounds	Minimum Reporting Limit	Client ID: Holding Tank Sample 1 ERCO ID: 17511 Sediment Phase
Chloromethane	10,000	ND
Bromomethane	10,000	ND
Vinyl chloride	10,000	ND
Chloroethane	10,000	ND
Methylene chloride	10,000	17,000
Acetone	100,000	ND
Carbon disulfide	2,000	ND
1,1-dichloroethene	2,000	ND
1,1-dichloroethane	2,000	ND
Trans-1,2-dichloroethene	2,000	ND
Chloroform	2,000	28,000
1,2-dichloroethane	2,000	ND
2-Butanone	20,000	160,000
1,1,1-trichloroethane	2,000	ND
Carbon tetrachloride	2,000	ND
Vinyl acetate	2,000	ND
Bromodichloromethane	2,000	ND
1,2-dichloropropane	2,000	ND
Trans-1,3-dichloropropene	2,000	ND
Trichloroethene	2,000	ND
Dibromochloromethane	2,000	ND
1,1,2-trichloroethane	2,000	ND
Benzene	2,000	190,000
Cis-1,3-dichloropropene	2,000	ND
2-Chloroethylvinylether	2,000	ND
Bromoform	2,000	ND
2-Hexanone	20,000	ND
4-Methyl-2-pentanone	20,000	ND
Tetrachloroethene	2,000	ND
1,1,2,2-Tetrachloroethane	2,000	ND
Toluene	2,000	1,300,000
Chlorobenzene	2,000	ND
Ethylbenzene	2,000	820,000
Styrene	2,000	ND
Total xylenes	2,000	3,900,000

ND = Not detected.

Unknowns present - see attached sheet.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS 21

CLIENT ID: Holding Tank Sample 1

ERCO ID: 17511 Sediment

CAS NUMBER	COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
108872	Methyl cyclohexane	VOA	781	5,000,000
	Alkane C_{11} or larger	VOA	915	5,000,000
	Alkene or Cycloalkane C_{11} or larger	VOA	977	5,000,000
98828	Benzene (1-methylethyl)	VOA	1561	10,000,000

CLIENT: HWMSS-21 (Rock Island Refinery)
CLIENT ID: Holding Tank Sample #1 (Sediment layer)
ERCO ID: 17511C
SAMPLE RECEIVED: 7/2/85
ANALYSIS COMPLETED: 9/18/85
RESULTS IN: µg/kg (ppb) wet weight

ERCO / A Division of ENSECO

SUMMARY OF
ORGANIC PRIORITY POLLUTANT ANALYSIS

	ACID COMPOUNDS	
21A	2,4,6-trichlorophenol	ND
22A	p-chloro-m-cresol	ND
24A	2-chlorophenol	ND
31A	2,4-dichlorophenol	ND
34A	2,4-dimethylphenol	860
57A	2-nitrophenol	ND
58A	4-nitrophenol	ND
59A	2,4-dinitrophenol	ND
60A	4,6-dinitro-o-cresol	ND
64A	pentachlorophenol	ND
65A	phenol	1,500

	BASE/NEUTRAL COMPOUNDS	
1B	acenaphthene	5,400
5B	benzidine	ND
8B	1,2,4-trichlorobenzene	ND
9B	hexachlorobenzene	ND
12B	hexachloroethane	ND
18B	bis(2-chloroethyl)ether	ND
20B	2-chloronaphthalene	ND
25B	1,2-dichlorobenzene	ND
26B	1,3-dichlorobenzene	ND
27B	1,4-dichlorobenzene	ND
28B	3,3-dichlorobenzidine	ND
35B	2,4-dinitrotoluene	ND
36B	2,6-dinitrotoluene	ND
37B	1,2-diphenylhydrazine	ND
39B	fluoranthene	16,000
40B	4-chlorophenyl phenyl ether	ND
41B	4-bromophenyl phenyl ether	ND
42B	bis(2-chloroisopropyl)ether	ND
43B	bis(2-chloroethoxy)methane	ND
52B	hexachlorobutadiene	ND
53B	hexachlorocyclopentadiene	ND
54B	isophorone	ND
55B	naphthalene	23,000
56B	nitrobenzene	ND
61B	N-nitrosodimethylamine	ND
62B	N-nitrosodiphenylamine	ND
63B	N-nitrosodi-n-propylamine	ND
66B	bis(2-ethylhexyl)phthalate	ND
67B	butyl benzyl phthalate	ND
68B	di-n-butylphthalate	ND
69B	di-n-octylphthalate	ND
70B	diethyl phthalate	ND
71B	dimethyl phthalate	ND
72B	benzo(a)anthracene	50,000
73B	benzo(a)pyrene	26,000
74B	3,4-benzofluoranthene	15,000
75B	benzo(k)fluoranthene	
76B	chrysene	98,000
77B	acenaphthylene	*1,500
78B	anthracene	20,000
79B	benzo(ghi)perylene	6,000
80B	fluorene	16,000
81B	phenanthrene	110,000
82B	dibenzo(a,h)anthracene	*3,900
83B	ideno(1,2,3-cd)pyrene	*2,300
84B	pyrene	75,000
129B	2,3,7,8-tetrachlorodibenzo-p-dioxin	ND

ND = None detected above the average reporting limit of 480 ppb for acids and 11,000 ppb for B/N.

Reported by: _____
Checked by: _____

*Trace concentrations detected below the PNA reporting limit of 5,000 ppb.

**Coelution

Additional Appendix VIII Compounds for Petroleum Refinery Industry[a,b]

CLIENT ID: Holding Tank Sample #1 (Sediment layer)

ERCO ID: 17511C

Results in: µg/kg (ppb) wet weight

Benzenethiol	ND
Indene	2,200
Quinoline	ND
1-Methylnaphthalene	ND
Dibenz(a,h)acridine[c]	ND

[a]Benz(j)fluoranthene, 7,12-dimethylbenz(a)anthracene are not reported due to lack of reference standard.

[b]Pyridine is too volatile for semivolatile analysis.

[c]Standard not available, response factor of isomeric dibenz(a,j)acridine used.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS-21 (Rock Island Refinery)

CLIENT ID: Holding Tank Sample #1

ERCO ID: 17511C

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (μg/kg)
4-Hydroxy-4-methyl-2-pentanone (aldol condensation product)	ACID	311	45,000
4-Methylphenol	ACID	566	1,500
Unknown	ACID	722	940
Dedecanoic Adic	ACID	747	220
Unknown	ACID	1,023	220

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS-21 (Rock Island Refinery)

CLIENT ID: Holding Tank Sample #1

ERCO ID: 17511C

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
C_1-Phenanthrene/anthracene isomer	BN	1262	490,000
C_1-Phenanthrene/anthracene isomer	BN	1274	260,000
C_2-Phenanthrene/anthracene isomer	BN	1338	230,000
C_2-Phenanthrene/anthracene isomer	BN	1349	330,000
C_2-Phenanthrene/anthracene isomer	BN	1360	110,000
C_3-Phenanthrene/anthracene isomer	BN	1422	190,000
C_1-Pyrene isomer	BN	1469	130,000
C_1-Pyrene isomer	BN	1483	170,000
C_2-Pyrene isomer	BN	1538	120,000
C_2-Pyrene isomer	BN	1548	140,000
C_3-Pyrene isomer	BN	1604	140,000
C_1-Chrysene isomer	BN	1654	210,000

RESULTS OF TOTAL ANALYSIS (µg/g wet wt.)

Sample ID: Holding Tank Sample #1
ERCO ID: 17511C (Sediment layer)

EP-Toxicity Metals

As	<2.5
Ba	13
Cd	<0.50
Cr	54
Pb	6.0
Hg	<0.045
Se	<2.5
Ag	<0.50

Additional Priority Pollutant Metals

Sb	<2.5
Be	<0.50
Cu	5.2
Ni	4.3
Tl	<2.5
Zn	53

Additional Metals

Ca	13,400
Fe	670
Mn	17
Na	2,410
V	<5.0

Other Parameters

Total-CN	<0.094
Cl-Amen-CN	NA
TOC	374,000
Oil & Grease	NA
Sulfide	<0.35

% Solids NA

NA = Not applicable.

CLIENT: HWMSS-21 (Rock Island Refinery)

SAMPLE RECEIVED: 7/1/85

ANALYSIS COMPLETED: 12/19/85

RESULTS IN: µg/g (ppm) wet wt.

REPORTED BY:

CHECKED BY:

ENSECO INCORPORATED

PESTICIDE ANALYSIS

- Data Report -

Compound	Client ID: Holding Tank Sample #1 ERCO ID: 17511 C (Sediment layer)
89P aldrin	ND
90P dieldrin	ND
91P chlordane	ND
92P 4,4'-DDT	ND
93P 4,4'-DDE	ND
94P 4,4'-DDD	ND
95P alpha-endosulfan	ND
96P beta-endosulfan	ND
97P endosulfan sulfate	ND
98P endrin	ND
99P endrin aldehyde	ND
100P heptachlor	ND
101P heptachlor epoxide	ND
102P alpha-BHC	ND
103P beta-BHC	ND
104P gamma-BHC	ND
105P delta-BHC	ND
106P PCB-1242	ND
107P PCB-1254	ND
108P PCB-1221	ND
109P PCB-1232	ND
110P PCB-1248	ND
111P PCB-1260	ND
112P PCB-1016	ND
113P toxaphene	ND

ND = Not detected at or above reporting limit of 0.2 ppm.

Date Sampled: 6/24/85
Analysis Completed: 7/8/85
All Results in: ng/g (ppb)
Reported by:
Checked by:
Client: HWMSS 21 Rock Island Refinery

ERCO / A Division of ENSECO
VOLATILE ORGANICS ANALYSIS
BY EPA METHOD 624
- Data Report -

Compounds	Minimum Reporting Limit	Client ID: Holding Tank Sample 2 ERCO ID: 17512 Sediment Phase
Chloromethane	10,000	ND
Bromomethane	10,000	ND
Vinyl chloride	10,000	ND
Chloroethane	10,000	ND
Methylene chloride	10,000	28,000
Acetone	100,000	ND
Carbon disulfide	2,000	ND
1,1-dichloroethene	2,000	ND
1,1-dichloroethane	2,000	ND
Trans-1,2-dichloroethene	2,000	ND
Chloroform	2,000	50,000
1,2-dichloroethane	2,000	ND
2-Butanone	20,000	210,000
1,1,1-trichloroethane	2,000	ND
Carbon tetrachloride	2,000	ND
Vinyl acetate	2,000	ND
Bromodichloromethane	2,000	ND
1,2-dichloropropane	2,000	ND
Trans-1,3-dichloropropene	2,000	ND
Trichloroethene	2,000	ND
Dibromochloromethane	2,000	ND
1,1,2-trichloroethane	2,000	ND
Benzene	2,000	36,000
Cis-1,3-dichloropropene	2,000	ND
2-Chloroethylvinylether	2,000	ND
Bromoform	2,000	ND
2-Hexanone	20,000	ND
4-Methyl-2-pentanone	20,000	ND
Tetrachloroethene	2,000	ND
1,1,2,2-Tetrachloroethane	2,000	ND
Toluene	2,000	190,000
Chlorobenzene	2,000	ND
Ethylbenzene	2,000	100,000
Styrene	2,000	ND
Total xylenes	2,000	530,000

ND = Not detected.
Unknowns present - see attached sheet.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS 21

CLIENT ID: Holding Tank Sample 2

ERCO ID: 17512 Sediment

CAS NUMBER	COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
99876	Benzene, 1-methyl-4-(1-methylethyl)	VOA	912	100,000
98066	Benzene (1,1 Dimethylethyl)	VOA	972	200,000
	Aliphatic hydrocarbons	VOA	1044	200,000
98828	Benzene (1-methylethyl)	VOA	1562	200,000

CLIENT: HWMSS-21 (Rock Island Refinery)
CLIENT ID: Holding Tank Sample #2 (Sediment layer)
ERCO ID: 17512C
SAMPLE RECEIVED: 7/2/85
ANALYSIS COMPLETED: 8/23/85
RESULTS IN: µg/kg (ppb) wet weight

ERCO / A Division of ENSECO

SUMMARY OF
ORGANIC PRIORITY POLLUTANT ANALYSIS

	ACID COMPOUNDS	
21A	2,4,6-trichlorophenol	ND
22A	p-chloro-m-cresol	ND
24A	2-chlorophenol	ND
31A	2,4-dichlorophenol	ND
34A	2,4-dimethylphenol	2,200
57A	2-nitrophenol	ND
58A	4-nitrophenol	ND
59A	2,4-dinitrophenol	ND
60A	4,6-dinitro-o-cresol	ND
64A	pentachlorophenol	ND
65A	phenol	890

	BASE/NEUTRAL COMPOUNDS	
1B	acenaphthene	25,000
5B	benzidine	ND
8B	1,2,4-trichlorobenzene	ND
9B	hexachlorobenzene	ND
12B	hexachloroethane	ND
18B	bis(2-chloroethyl)ether	ND
20B	2-chloronaphthalene	ND
25B	1,2-dichlorobenzene	ND
26B	1,3-dichlorobenzene	ND
27B	1,4-dichlorobenzene	ND
28B	3,3-dichlorobenzidine	ND
35B	2,4-dinitrotoluene	ND
36B	2,6-dinitrotoluene	ND
37B	1,2-diphenylhydrazine	ND
39B	fluoranthene	75,000
40B	4-chlorophenyl phenyl ether	ND
41B	4-bromophenyl phenyl ether	ND
42B	bis(2-chloroisopropyl)ether	ND
43B	bis(2-chloroethoxy)methane	ND
52B	hexachlorobutadiene	ND
53B	hexachlorocyclopentadiene	ND
54B	isophorone	ND
55B	naphthalene	130,000
56B	nitrobenzene	ND
61B	N-nitrosodimethylamine	ND
62B	N-nitrosodiphenylamine	ND
63B	N-nitrosodi-n-propylamine	ND
66B	bis(2-ethylhexyl)phthalate	ND
67B	butyl benzyl phthalate	ND
68B	di-n-butylphthalate	ND
69B	di-n-octylphthalate	ND
70B	diethyl phthalate	ND
71B	dimethyl phthalate	ND
72B	benzo(a)anthracene	160,000
73B	benzo(a)pyrene	85,000
74B	3,4-benzofluoranthene**	40,000
75B	benzo(k)fluoranthene **	
76B	chrysene	290,000
77B	acenaphthylene	<9,200
78B	anthracene	75,000
79B	benzo(ghi)perylene	16,000
80B	fluorene	54,000
81B	phenanthrene	410,000
82B	dibenzo(a,h)anthracene	9,300
83B	ideno(1,2,3-cd)pyrene	<9,200
84B	pyrene	260,000
129B	2,3,7,8-tetrachlorodibenzo-p-dioxin	ND

ND = None detected above the average reporting limit of 660 ppb for acids and 46,000 ppb for B/N.

Reported by: _____
Checked by: _____

*Trace concentrations detected below the PNA reporting limit of 9,200 ppb.

**Coelution

Additional Appendix VIII Compounds for Petroleum Refinery Industry[a,b]

CLIENT ID: Holding Tank Sample #2 (Sediment Layer)

ERCO ID: 17512C

Results in: µg/kg (ppb) wet weight

Benzenethiol	ND
Indene	ND
Quinoline	ND
1-Methylnaphthalene	220,000
Dibenz(a,h)acridine[c]	ND

[a]Benz(j)fluoranthene, 7,12-dimethylbenz(a)anthracene are not reported due to lack of reference standard.

[b]Pyridine is too volatile for semivolatile analysis.

[c]Standard not available, response factor of isomeric dibenz(a,j)acridine used.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS-21 (Rock Island Refinery)

CLIENT ID: Holding Tank Sample #2 (Sediment Layer)

ERCO ID: 175120

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
C_1-Phenanthrene/anthracene isomer	BN	1253	880,000
C_1-Phenanthrene/anthracene isomer	BN	1271	920,000
C_2-Phenanthrene/anthracene isomer	BN	1332	890,000
C_3-Phenanthrene/anthracene isomer	BN	1398	390,000
C_3-Phenanthrene/anthracene isomer	BN	1417	630,000
C_1-Pyrene isomer	BN	1465	420,000
C_1-Pyrene isomer	BN	1479	570,000
C_2-Pyrene isomer	BN	1542	630,000
C_2-Pyrene isomer	BN	1563	410,000
C_1-Chrysene isomer	BN	1649	550,000

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS-21 (Rock Island Refinery)

CLIENT ID: Holding Tank Sample #2 (Sediment Layer)

ERCO ID: 17512C

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
4-Methylphenol	ACID	564	1,400
C_2-Phenol isomer	ACID	613	440
C_2-Phenol isomer	ACID	689	530
C_3-Phenol isomer	ACID	710	240
C_3-Phenol isomer	ACID	737	390
C_3-Phenol isomer	ACID	750	300
C_3-Phenol isomer	ACID	772	450
C_4-Phenol isomer	ACID	844	230
Dodecanoic acid	ACID	1023	730
Tridecanoic acid	ACID	1096	910
Unknown	ACID	1132	3300
Unknown	ACID	1140	960

RESULTS OF TOTAL ANALYSIS (µg/g wet wt.)

Sample ID: Holding Tank Sample #2
ERCO ID: 17512C (Sediment layer)

EP-Toxicity Metals

As	<2.5
Ba	19
Cd	<0.50
Cr	73
Pb	8.6
Hg	0.068
Se	<2.5
Ag	<0.50

Additional Priority Pollutant Metals

Sb	<2.5
Be	<0.50
Cu	5.2
Ni	12
Tl	<2.5
Zn	67

Additional Metals

Ca	13,600
Fe	660
Mn	16
Na	2,530
V	<5.0

Other Parameters

Total-CN	<0.130
Cl-Amen-CN	NA
TOC	489,000
Oil & Grease	NA
Sulfide	<0.81

% Solids NA

NA = Not applicable.

CLIENT: HWMSS-21 (Rock Island Refinery)

SAMPLE RECEIVED: 7/1/85

ANALYSIS COMPLETED: 12/19/85

RESULTS IN: µg/g (ppm) wet wt.

REPORTED BY:

CHECKED BY:

ENSECO INCORPORATED

PESTICIDE ANALYSIS

- Data Report -

Compound	Client ID: Holding Tank Sample #2 ERCO ID: 17512 C (Sediment layer)
89P aldrin	ND
90P dieldrin	ND
91P chlordane	ND
92P 4,4'-DDT	ND
93P 4,4'-DDE	ND
94P 4,4'-DDD	ND
95P alpha-endosulfan	ND
96P beta-endosulfan	ND
97P endosulfan sulfate	ND
98P endrin	ND
99P endrin aldehyde	ND
100P heptachlor	ND
101P heptachlor epoxide	ND
102P alpha-BHC	ND
103P beta-BHC	ND
104P gamma-BHC	ND
105P delta-BHC	ND
106P PCB-1242	ND
107P PCB-1254	ND
108P PCB-1221	ND
109P PCB-1232	ND
110P PCB-1248	ND
111P PCB-1260	ND
112P PCB-1016	ND
113P toxaphene	ND

ND = Not detected at or above reporting limit of 0.3 ppm.

RESULTS OF EP-TOXICITY LEACHATE ANALYSIS (mg/l)

Sample ID: Holding Tank Sample 1
ERCO ID: 17511

EP-Toxicity Metals

As	<0.19
Ba	0.75
Cd	<0.11
Cr	0.59
Pb	<1.1
Hg	0.0026
Se	<0.19
Ag	<0.056
Cr^{+6}	

Additional Priority Pollutant Metals

Sb	--
Be	<0.028
Cu	0.28
Ni	0.16
Tl	--
Zn	2.2

Additional Metals

Ca	260
Fe	7.6
Mn	0.37
Na	95
V	0.18

EP Extraction Data

Initial pH
Final pH
Acetic acid

RESULTS OF EP-TOXICITY LEACHATE ANALYSIS (mg/l)

Sample ID: Holding Tank Sample 2
ERCO ID: 17512

EP-Toxicity Metals

As	<0.23
Ba	0.25
Cd	<0.15
Cr	0.66
Pb	[1.5]*
Hg	0.0020
Se	<0.23
Ag	<0.075
Cr^{+6}	

Additional Priority Pollutant Metals

Sb	--
Be	<0.037
Cu	<0.76
Ni	<0.37
Tl	--
Zn	1.2

Additional Metals

Ca	177
Fe	6.9
Mn	0.16
Na	74
V	0.40

EP Extraction Data

Initial pH
Final pH
Acetic acid

*Additional concentration of mobile metal if metal concentration was present just below the detection limit.

Date Sampled: 6/24/85
Analysis Completed: 7/7/85
All Results in: ng/g (ppb)
Reported by:
Checked by:
Client: HWMSS 21 Rock Island Refinery

ERCO / A Division of ENSECO
VOLATILE ORGANICS ANALYSIS
BY EPA METHOD 624
- Data Report -

Compounds	Minimum Reporting Limit	Client ID: ERCO ID:	Holding Tank Sample 1 175 1 H_2O Phase
Chloromethane	10,000		ND
Bromomethane	10,000		ND
Vinyl chloride	10,000		ND
Chloroethane	10,000		ND
Methylene chloride	10,000		23,000
Acetone	100,000		ND
Carbon disulfide	2,000		ND
1,1-dichloroethene	2,000		22,000
1,1-dichloroethane	2,000		ND
Trans-1,2-dichloroethene	2,000		ND
Chloroform	2,000		95,000
1,2-dichloroethane	2,000		ND
2-Butanone	20,000		67,000
1,1,1-trichloroethane	2,000		ND
Carbon tetrachloride	2,000		ND
Vinyl acetate	2,000		ND
Bromodichloromethane	2,000		ND
1,2-dichloropropane	2,000		ND
Trans-1,3-dichloropropene	2,000		ND
Trichloroethene	2,000		ND
Dibromochloromethane	2,000		ND
1,1,2-trichloroethane	2,000		ND
Benzene	2,000		48,000
Cis-1,3-dichloropropene	2,000		ND
2-Chloroethylvinylether	2,000		ND
Bromoform	2,000		ND
2-Hexanone	20,000		ND
4-Methyl-2-pentanone	20,000		ND
Tetrachloroethene	2,000		ND
1,1,2,2-Tetrachloroethane	2,000		ND
Toluene	2,000		560,000
Chlorobenzene	2,000		ND
Ethylbenzene	2,000		290,000
Styrene	2,000		ND
Total xylenes	2,000		660,000

ND = Not detected.
Unknowns present - see attached sheet.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS 21

CLIENT ID: Holding Tank Sample 1

ERCO ID: 17511 H_2O

CAS NUMBER	COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/l)
	Alkene or Cycloalkane C_{10} or larger	VOA	781	1,000,000
	Alkane C_{11} or larger	VOA	912	1,000,000
	Alkene or Cycloalkane C_{10} or larger	VOA	977	1,000,000
	Alkene or Cycloalkane C_{11} or larger	VOA	1047	1,000,000
611143	Benzene, 1-ethyl-2-methyl	VOA	1565	2,000,000

Date Sampled: 6/24/85

Analysis Completed: 7/8/85

All Results in: ng/g (ppb)

Reported by:

Checked by:

Client: HWMSS 21 Rock Island Refinery

ERCO / A Division of ENSECO

VOLATILE ORGANICS ANALYSIS

BY EPA METHOD 624

- Data Report -

Compounds	Minimum Reporting Limit	Client ID: ERCO ID:	Holding Tank Sample 2 17512 H_2O Phase
Chloromethane	10,000		ND
Bromomethane	10,000		ND
Vinyl chloride	10,000		ND
Chloroethane	10,000		ND
Methylene chloride	10,000		19,000
Acetone	100,000		ND
Carbon disulfide	2,000		ND
1,1-dichloroethene	2,000		ND
1,1-dichloroethane	2,000		ND
Trans-1,2-dichloroethene	2,000		ND
Chloroform	2,000		23,000
1,2-dichloroethane	2,000		ND
2-Butanone	20,000		140,000
1,1,1-trichloroethane	2,000		ND
Carbon tetrachloride	2,000		ND
Vinyl acetate	2,000		ND
Bromodichloromethane	2,000		ND
1,2-dichloropropane	2,000		ND
Trans-1,3-dichloropropene	2,000		ND
Trichloroethene	2,000		ND
Dibromochloromethane	2,000		ND
1,1,2-trichloroethane	2,000		ND
Benzene	2,000		46,000
Cis-1,3-dichloropropene	2,000		ND
2-Chloroethylvinylether	2,000		ND
Bromoform	2,000		ND
2-Hexanone	20,000		ND
4-Methyl-2-pentanone	20,000		ND
Tetrachloroethene	2,000		ND
1,1,2,2-Tetrachloroethane	2,000		ND
Toluene	2,000		370,000
Chlorobenzene	2,000		ND
Ethylbenzene	2,000		180,000
Styrene	2,000		ND
Total xylenes	2,000		710,000

ND = Not detected.

Unknowns present - see attached sheet.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS 21

CLIENT ID: Holding Tank Sample 2

ERCO ID: 17512 H_2O Phase

CAS NUMBER	COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
	Alkane, Alkene or Cycloalkane	VOA	913	100,000
	Alkene Benzene	VOA	977	300,000
	Alkene Benzene	VOA	1563	200,000

APPENDIX A.4

- Suction Pit -

Date Sampled: 6/24/85
Analysis Completed: 7/8/85
All Results in: ng/g (ppb)
Reported by:
Checked by:
Client: HWMSS 21 Rock Island Refinery

ERCO / A Division of ENSECO
VOLATILE ORGANICS ANALYSIS
BY EPA METHOD 624
- Data Report -

Compounds	Minimum Reporting Limit	Client ID: Suction Pit Sample 1 ERCO ID: 17513 Oil Phase
Chloromethane	5,000	ND
Bromomethane	5,000	ND
Vinyl chloride	5,000	ND
Chloroethane	5,000	ND
Methylene chloride	5,000	11,000
Acetone	50,000	ND
Carbon disulfide	1,000	ND
1,1-dichloroethene	1,000	ND
1,1-dichloroethane	1,000	ND
Trans-1,2-dichloroethene	1,000	ND
Chloroform	1,000	ND
1,2-dichloroethane	1,000	ND
2-Butanone	10,000	ND
1,1,1-trichloroethane	1,000	ND
Carbon tetrachloride	1,000	ND
Vinyl acetate	1,000	ND
Bromodichloromethane	1,000	ND
1,2-dichloropropane	1,000	ND
Trans-1,3-dichloropropene	1,000	ND
Trichloroethene	1,000	ND
Dibromochloromethane	1,000	ND
1,1,2-trichloroethane	1,000	ND
Benzene	1,000	20,000
Cis-1,3-dichloropropene	1,000	ND
2-Chloroethylvinylether	1,000	ND
Bromoform	1,000	ND
2-Hexanone	10,000	ND
4-Methyl-2-pentanone	10,000	ND
Tetrachloroethene	1,000	ND
1,1,2,2-Tetrachloroethane	1,000	ND
Toluene	1,000	270,000
Chlorobenzene	1,000	ND
Ethylbenzene	1,000	210,000
Styrene	1,000	ND
Total xylenes	1,000	1,100,000

ND = Not detected.
Unknowns present - see attached sheet.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS 21

CLIENT ID: Suction Pit Sample 1

ERCO ID: 17513 Oil

CAS NUMBER	COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
	Alkane, Alkene or Cycloalkane	VOA	913	200,000
	Alkane, Alkene or Cycloalkane	VOA	1045	200,000
	Alkyl benzene	VOA	1169	300,000
103651	Propyl benzene	VOA	1383	300,000
611143	Benzene, 1-ethyl-2-methyl	VOA	1560	500,000

Date Sampled: 6/24/85

Analysis Completed: 7/8/85

All Results in: ng/g (ppb)

Reported by:

Checked by:

Client: HWMSS 21 Rock Island Refinery

ERCO / A Division of ENSECO

VOLATILE ORGANICS ANALYSIS

BY EPA METHOD 624

- Data Report -

Compounds	Minimum Reporting Limit	Client ID: ERCO ID:	Suction Pit Sample 1 17513 Sediment Phase
Chloromethane	5,000		ND
Bromomethane	5,000		ND
Vinyl chloride	5,000		ND
Chloroethane	5,000		ND
Methylene chloride	5,000		ND
Acetone	50,000		ND
Carbon disulfide	1,000		ND
1,1-dichloroethene	1,000		ND
1,1-dichloroethane	1,000		ND
Trans-1,2-dichloroethene	1,000		ND
Chloroform	1,000		ND
1,2-dichloroethane	1,000		ND
2-Butanone	10,000		ND
1,1,1-trichloroethane	1,000		ND
Carbon tetrachloride	1,000		ND
Vinyl acetate	1,000		ND
Bromodichloromethane	1,000		ND
1,2-dichloropropane	1,000		ND
Trans-1,3-dichloropropene	1,000		ND
Trichloroethene	1,000		ND
Dibromochloromethane	1,000		ND
1,1,2-trichloroethane	1,000		ND
Benzene	1,000		11,000
Cis-1,3-dichloropropene	1,000		ND
2-Chloroethylvinylether	1,000		ND
Bromoform	1,000		ND
2-Hexanone	10,000		ND
4-Methyl-2-pentanone	10,000		ND
Tetrachloroethene	1,000		ND
1,1,2,2-Tetrachloroethane	1,000		ND
Toluene	1,000		190,000
Chlorobenzene	1,000		ND
Ethylbenzene	1,000		140,000
Styrene	1,000		ND
Total xylenes	1,000		790,000

ND = Not detected.

Unknowns present - see attached sheet.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS 21

CLIENT ID: Suction Pit Sample 1

ERCO ID: 17513 Sediment

CAS NUMBER	COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
	Alkane, Alkene or Cycloalkane	VOA	1350	100,000
103651	Propyl benzene	VOA	1387	200,000
611143	Benzene, 1-ethyl-2-methyl	VOA	1560	500,000

Date Sampled: 6/24/85
Analysis Completed: 7/8/85
All Results in: ng/g (ppb)
Reported by:
Checked by:
Client: HWMSS 21 Rock Island Refinery

ERCO / A Division of ENSECO
VOLATILE ORGANICS ANALYSIS
BY EPA METHOD 624
- Data Report -

Compounds	Minimum Reporting Limit	Client ID: Suction Pit Sample 1 ERCO ID: 17513 H_2O Phase
Chloromethane	5,000	ND
Bromomethane	5,000	ND
Vinyl chloride	5,000	ND
Chloroethane	5,000	ND
Methylene chloride	5,000	ND
Acetone	50,000	ND
Carbon disulfide	1,000	ND
1,1-dichloroethene	1,000	ND
1,1-dichloroethane	1,000	ND
Trans-1,2-dichloroethene	1,000	ND
Chloroform	1,000	2,900
1,2-dichloroethane	1,000	ND
2-Butanone	10,000	ND
1,1,1-trichloroethane	1,000	ND
Carbon tetrachloride	1,000	ND
Vinyl acetate	1,000	ND
Bromodichloromethane	1,000	ND
1,2-dichloropropane	1,000	ND
Trans-1,3-dichloropropene	1,000	ND
Trichloroethene	1,000	ND
Dibromochloromethane	1,000	ND
1,1,2-trichloroethane	1,000	ND
Benzene	1,000	ND
Cis-1,3-dichloropropene	1,000	ND
2-Chloroethylvinylether	1,000	ND
Bromoform	1,000	ND
2-Hexanone	10,000	ND
4-Methyl-2-pentanone	10,000	ND
Tetrachloroethene	1,000	ND
1,1,2,2-Tetrachloroethane	1,000	ND
Toluene	1,000	18,000
Chlorobenzene	1,000	ND
Ethylbenzene	1,000	12,000
Styrene	1,000	ND
Total xylenes	1,000	67,000

ND = Not detected.
Unknowns present - see attached sheet.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS 21

CLIENT ID: Suction Pit Sample 1

ERCO ID: 17513 H_2O

CAS NUMBER	COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/l)
90120	Naphthalene (1-methyl)	VOA	1390	50,000
611143	Benzene, 1-ethyl-2-methyl	VOA	1567	150,000

CLIENT: HWMSS-21 (Rock Island Refinery)
CLIENT ID: Suction Pit Sample #1
ERCO ID: 17513
SAMPLE RECEIVED: 7/2/85
ANALYSIS COMPLETED: 8/21/85
RESULTS IN: µg/kg (ppb) wet weight

ERCO / A Division of ENSECO

SUMMARY OF
ORGANIC PRIORITY POLLUTANT ANALYSIS

	ACID COMPOUNDS	
21A	2,4,6-trichlorophenol	ND
22A	p-chloro-m-cresol	ND
24A	2-chlorophenol	ND
31A	2,4-dichlorophenol	ND
34A	2,4-dimethylphenol	2,300
57A	2-nitrophenol	ND
58A	4-nitrophenol	ND
59A	2,4-dinitrophenol	ND
60A	4,6-dinitro-o-cresol	ND
64A	pentachlorophenol	ND
65A	phenol	*560

	BASE/NEUTRAL COMPOUNDS	
1B	acenaphthene	24,000
5B	benzidine	ND
8B	1,2,4-trichlorobenzene	ND
9B	hexachlorobenzene	ND
12B	hexachloroethane	ND
18B	bis(2-chloroethyl)ether	ND
20B	2-chloronaphthalene	ND
25B	1,2-dichlorobenzene	ND
26B	1,3-dichlorobenzene	ND
27B	1,4-dichlorobenzene	ND
28B	3,3-dichlorobenzidine	ND
35B	2,4-dinitrotoluene	ND
36B	2,6-dinitrotoluene	ND
37B	1,2-diphenylhydrazine	ND
39B	fluoranthene	180,000
40B	4-chlorophenyl phenyl ether	ND
41B	4-bromophenyl phenyl ether	ND
42B	bis(2-chloroisopropyl)ether	ND
43B	bis(2-chloroethoxy)methane	ND
52B	hexachlorobutadiene	ND
53B	hexachlorocyclopentadiene	ND
54B	isophorone	ND
55B	naphthalene	140,000
56B	nitrobenzene	ND
61B	N-nitrosodimethylamine	ND
62B	N-nitrosodiphenylamine	ND
63B	N-nitrosodi-n-propylamine	ND
66B	bis(2-ethylhexyl)phthalate	ND
67B	butyl benzyl phthalate	ND
68B	di-n-butylphthalate	ND
69B	di-n-octylphthalate	ND
70B	diethyl phthalate	ND
71B	dimethyl phthalate	ND
72B	benzo(a)anthracene	360,000
73B	benzo(a)pyrene	200,000
74B	3,4-benzofluoranthene**)	100,000
75B	benzo(k)fluoranthene **)	
76B	chrysene	720,000
77B	acenaphthylene	<32,000
78B	anthracene	120,000
79B	benzo(ghi)perylene	64,000
80B	fluorene	80,000
81B	phenanthrene	680,000
82B	dibenzo(a,h)anthracene	53,300
83B	ideno(1,2,3-cd)pyrene	<32,000
84B	pyrene	510,000
129B	2,3,7,8-tetrachlorodibenzo-p-dioxin	ND

ND = None detected above the average reporting limit of 710 ppb for acids and 160,000 ppb for B/N.

Reported by: _____
Checked by: _____

*Trace concentrations detected below the PNA reporting limit of 3,200 ppb.

**Coelution

Additional Appendix VIII Compounds for Petroleum Refinery Industry[a,b]

CLIENT ID: Suction Pit Sample #1

ERCO ID: 17513

Results in: µg/kg (ppb) wet weight

Benzenethiol	ND
Indene	ND
Quinoline	ND
1-Methylnaphthalene	290,000
Dibenz(a,h)acridine[c]	ND

[a]Benz(j)fluoranthene, 7,12-dimethylbenz(a)anthracene are not reported due to lack of reference standard.

[b]Pyridine is too volatile for semivolatile analysis.

[c]Standard not available, response factor of isomeric dibenz(a,j)acridine used.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS-21 (Rock Island Refinery)

CLIENT ID: Suction Pit Sample #1

ERCO ID: 17513

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
4-Methylphenol	ACID	565	790
C_3-Phenol isomer	ACID	737	710
C_3-Phenol isomer	ACID	767	810
Dodecanoic acid	ACID	1022	520
Unknown	ACID	1131	1,900
Hexadecanoic acid	ACID	1293	1,100
Unknown	ACID	1754	3,400

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS-21 (Rock Island Refinery)

CLIENT ID: Suction Pit Sample #1

ERCO ID: 17513

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
C_1-Phenanthrene/anthracene isomer	BN	1251	1,500,000
C_1-Phenanthrene/anthracene isomer	BN	1255	1,200,000
C_1-Phenanthrene/anthracene isomer	BN	1268	1,800,000
C_2-Phenanthrene/anthracene isomer	BN	1323	900,000
C_2-Phenanthrene/anthracene isomer	BN	1329	2,000,000
C_2-Phenanthrene/anthracene isomer	BN	1346	1,500,000
C_3-Phenanthrene/anthracene isomer	BN	1408	960,000
C_3-Phenanthrene/anthracene isomer	BN	1415	1,300,000
C_1-Pyrene	BN	1462	1,100,000
C_1-Pyrene	BN	1476	1,500,000

RESULTS OF TOTAL ANALYSIS (µg/g wet wt.)

Sample ID: Suction Pit Sample #1
ERCO ID: 17513

EP-Toxicity Metals

As	<2.4
Ba	23
Cd	<0.49
Cr	100
Pb	13
Hg	0.083
Se	<2.4
Ag	<0.49

Additional Priority Pollutant Metals

Sb	<2.4
Be	<0.49
Cu	7.8
Ni	4.8
Tl	<2.4
Zn	73

Additional Metals

Ca	19,200
Fe	970
Mn	20
Na	3,190
V	6.2

Other Parameters

Total-CN	<0.207
Cl-Amen-CN	NA
TOC	111,000
Oil & Grease	NA
Sulfide	<0.64

% Solids NA

NA = Not applicable.

RESULTS OF EP-TOXICITY LEACHATE ANALYSIS (mg/l)

Sample ID: Suction Pit Sample 1
ERCO ID: 17513

EP-Toxicity Metals

As	<0.20
Ba	0.68
Cd	<0.15
Cr	0.22
Pb	[1.5]*
Hg	0.0019
Se	<0.20
Ag	<0.077
Cr^{+6}	

Additional Priority Pollutant Metals

Sb	--
Be	<0.037
Cu	0.24
Ni	<0.37
Tl	--
Zn	3.9

Additional Metals

Ca	94
Fe	1.5
Mn	0.12
Na	100
V	0.067

EP Extraction Data

Initial pH	
Final pH	
Acetic acid	

*Additional concentration of mobile metal if metal concentration was present just below the detection limit.

CLIENT: HWMSS-21 (Rock Island Refinery)

SAMPLE RECEIVED: 7/1/85

ANALYSIS COMPLETED: 12/19/85

RESULTS IN: µg/g (ppm) wet wt.

REPORTED BY:

CHECKED BY:

ENSECO INCORPORATED

PESTICIDE ANALYSIS

- Data Report -

Compound	Client ID: Suction Pit Sample #1 ERCO ID: 17513
89P aldrin	ND
90P dieldrin	ND
91P chlordane	ND
92P 4,4'-DDT	ND
93P 4,4'-DDE	ND
94P 4,4'-DDD	ND
95P alpha-endosulfan	ND
96P beta-endosulfan	ND
97P endosulfan sulfate	ND
98P endrin	ND
99P endrin aldehyde	ND
100P heptachlor	ND
101P heptachlor epoxide	ND
102P alpha-BHC	ND
103P beta-BHC	ND
104P gamma-BHC	ND
105P delta-BHC	ND
106P PCB-1242	ND
107P PCB-1254	ND
108P PCB-1221	ND
109P PCB-1232	ND
110P PCB-1248	ND
111P PCB-1260	ND
112P PCB-1016	ND
113P toxaphene	ND

ND = Not detected at or above reporting limit of 0.3 ppm.

Date Sampled: 6/24/85

Analysis Completed: 7/8/85

All Results in: ng/g (ppb)

Reported by:

Checked by:

Client: HWMSS 21 Rock Island Refinery

ERCO / A Division of ENSECO

VOLATILE ORGANICS ANALYSIS

BY EPA METHOD 624

- Data Report -

Compounds	Minimum Reporting Limit	Client ID: Suction Pit Sample 2 ERCO ID: 17514 Oil Phase
Chloromethane	4,650	ND
Bromomethane	4,650	ND
Vinyl chloride	4,650	ND
Chloroethane	4,650	ND
Methylene chloride	4,650	ND
Acetone	46,500	ND
Carbon disulfide	930	ND
1,1-dichloroethene	930	ND
1,1-dichloroethane	930	ND
Trans-1,2-dichloroethene	930	ND
Chloroform	930	ND
1,2-dichloroethane	930	ND
2-Butanone	9,300	ND
1,1,1-trichloroethane	930	ND
Carbon tetrachloride	930	ND
Vinyl acetate	930	ND
Bromodichloromethane	930	ND
1,2-dichloropropane	930	ND
Trans-1,3-dichloropropene	930	ND
Trichloroethene	930	ND
Dibromochloromethane	930	ND
1,1,2-trichloroethane	930	ND
Benzene	930	12,000
Cis-1,3-dichloropropene	930	ND
2-Chloroethylvinylether	930	ND
Bromoform	930	ND
2-Hexanone	9,300	ND
4-Methyl-2-pentanone	9,300	ND
Tetrachloroethene	930	ND
1,1,2,2-Tetrachloroethane	930	ND
Toluene	930	150,000
Chlorobenzene	930	ND
Ethylbenzene	930	100,000
Styrene	930	ND
Total xylenes	930	700,000

ND = Not detected.
Unknowns present - see attached sheet.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS 21

CLIENT ID: Suction Pit Sample 2

ERCO ID: 17514 Oil

CAS NUMBER	COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
	Aliphatic hydrocarbons	VOA	915	50,000
	Aliphatic hydrocarbons	VOA	1049	50,000
	Alkyl benzene	VOA	1172	50,000
108678	Benzene, 1,3,5,-trimethyl	VOA	1352	100,000
620144	Benzene, 1-ethyl 1-3-methyl	VOA	1567	100,000
103651	Benzene, propyl	VOA	1386	100,000

Date Sampled: 6/24/85
Analysis Completed: 7/8/85
All Results in: ng/g (ppb)
Reported by:
Checked by:
Client: HWMSS 21 Rock Island Refinery

ERCO / A Division of ENSECO
VOLATILE ORGANICS ANALYSIS
BY EPA METHOD 624
- Data Report -

Compounds	Minimum Reporting Limit	Client ID: ERCO ID: Suction Pit Sample 2 17514 Sediment Phase
Chloromethane	5,000	ND
Bromomethane	5,000	ND
Vinyl chloride	5,000	ND
Chloroethane	5,000	ND
Methylene chloride	5,000	23,000
Acetone	50,000	ND
Carbon disulfide	1,000	ND
1,1-dichloroethene	1,000	ND
1,1-dichloroethane	1,000	ND
Trans-1,2-dichloroethene	1,000	ND
Chloroform	1,000	ND
1,2-dichloroethane	1,000	ND
2-Butanone	10,000	ND
1,1,1-trichloroethane	1,000	ND
Carbon tetrachloride	1,000	ND
Vinyl acetate	1,000	ND
Bromodichloromethane	1,000	ND
1,2-dichloropropane	1,000	ND
Trans-1,3-dichloropropene	1,000	ND
Trichloroethene	1,000	ND
Dibromochloromethane	1,000	ND
1,1,2-trichloroethane	1,000	ND
Benzene	1,000	ND
Cis-1,3-dichloropropene	1,000	ND
2-Chloroethylvinylether	1,000	ND
Bromoform	1,000	ND
2-Hexanone	10,000	ND
4-Methyl-2-pentanone	10,000	ND
Tetrachloroethene	1,000	ND
1,1,2,2-Tetrachloroethane	1,000	ND
Toluene	1,000	98,000
Chlorobenzene	1,000	ND
Ethylbenzene	1,000	67,000
Styrene	1,000	ND
Total xylenes	1,000	410,000

ND = Not detected.
Unknowns present - see attached sheet.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS 21

CLIENT ID: Suction Pit Sample 2

ERCO ID: 17514 Sediment

CAS NUMBER	COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
99876	Benzene 1-methyl-4 (1-methylethyl)	VOA	913	50,000
	Alkane, Alkene Or Cycloalkane	VOA	1045	200,000
	Possible aliphatic hydrocarbon	VOA	1349	200,000
	Alkyl benzene	VOA	1387	200,000
	Benzene (1-methylethyl)	VOA	1564	400,000

Date Sampled: 6/24/85
Analysis Completed: 7/8/85
All Results in: ng/g (ppb)
Reported by:
Checked by:
Client: HWMSS 21 Rock Island Refinery

ERCO / A Division of ENSECO
VOLATILE ORGANICS ANALYSIS
BY EPA METHOD 624
- Data Report -

Compounds	Minimum Reporting Limit	Client ID: Suction Pit Sample 2 ERCO ID: 17514 H_2O Phase
Chloromethane	5,000	ND
Bromomethane	5,000	ND
Vinyl chloride	5,000	ND
Chloroethane	5,000	28,000
Methylene chloride	5,000	ND
Acetone	50,000	ND
Carbon disulfide	1,000	ND
1,1-dichloroethene	1,000	ND
1,1-dichloroethane	1,000	ND
Trans-1,2-dichloroethene	1,000	ND
Chloroform	1,000	ND
1,2-dichloroethane	1,000	ND
2-Butanone	10,000	ND
1,1,1-trichloroethane	1,000	ND
Carbon tetrachloride	1,000	ND
Vinyl acetate	1,000	ND
Bromodichloromethane	1,000	ND
1,2-dichloropropane	1,000	ND
Trans-1,3-dichloropropene	1,000	ND
Trichloroethene	1,000	ND
Dibromochloromethane	1,000	ND
1,1,2-trichloroethane	1,000	ND
Benzene	1,000	ND
Cis-1,3-dichloropropene	1,000	ND
2-Chloroethylvinylether	1,000	ND
Bromoform	1,000	ND
2-Hexanone	10,000	ND
4-Methyl-2-pentanone	10,000	ND
Tetrachloroethene	1,000	ND
1,1,2,2-Tetrachloroethane	1,000	ND
Toluene	1,000	9,300
Chlorobenzene	1,000	ND
Ethylbenzene	1,000	2,300
Styrene	1,000	ND
Total xylenes	25,000	ND

ND = Not detected.
No unknowns.

CLIENT: HWMSS-21 (Rock Island Refinery)
CLIENT ID: Suction Pit Sample #2 (Oil Layer)
ERCO ID: 17514A
SAMPLE RECEIVED: 7/2/85
ANALYSIS COMPLETED: 8/21/85
RESULTS IN: µg/l (ppb)

ERCO / A Division of ENSECO

SUMMARY OF
ORGANIC PRIORITY POLLUTANT ANALYSIS

	ACID COMPOUNDS	
21A	2,4,6-trichlorophenol	ND
22A	p-chloro-m-cresol	ND
24A	2-chlorophenol	ND
31A	2,4-dichlorophenol	ND
34A	2,4-dimethylphenol	ND
57A	2-nitrophenol	ND
58A	4-nitrophenol	ND
59A	2,4-dinitrophenol	ND
60A	4,6-dinitro-o-cresol	ND
64A	pentachlorophenol	ND
65A	phenol	ND

	BASE/NEUTRAL COMPOUNDS	
1B	acenaphthene	42,000
5B	benzidine	ND
8B	1,2,4-trichlorobenzene	ND
9B	hexachlorobenzene	ND
12B	hexachloroethane	ND
18B	bis(2-chloroethyl)ether	ND
20B	2-chloronaphthalene	ND
25B	1,2-dichlorobenzene	ND
26B	1,3-dichlorobenzene	ND
27B	1,4-dichlorobenzene	ND
28B	3,3-dichlorobenzidine	ND
35B	2,4-dinitrotoluene	ND
36B	2,6-dinitrotoluene	ND
37B	1,2-diphenylhydrazine	ND
39B	fluoranthene	210,000
40B	4-chlorophenyl phenyl ether	ND
41B	4-bromophenyl phenyl ether	ND
42B	bis(2-chloroisopropyl)ether	ND
43B	bis(2-chloroethoxy)methane	ND
52B	hexachlorobutadiene	ND
53B	hexachlorocyclopentadiene	ND
54B	isophorone	ND
55B	naphthalene	310,000
56B	nitrobenzene	ND
61B	N-nitrosodimethylamine	ND
62B	N-nitrosodiphenylamine	ND
63B	N-nitrosodi-n-propylamine	ND
66B	bis(2-ethylhexyl)phthalate	ND
67B	butyl benzyl phthalate	ND
68B	di-n-butylphthalate	ND
69B	di-n-octylphthalate	ND
70B	diethyl phthalate	ND
71B	dimethyl phthalate	ND
72B	benzo(a)anthracene	290,000
73B	benzo(a)pyrene	170,000
74B	3,4-benzofluoranthene**	84,000
75B	benzo(k)fluoranthene **	
76B	chrysene	520,000
77B	acenaphthylene	25,000
78B	anthracene	100,000
79B	benzo(ghi)perylene	56,000
80B	fluorene	71,000
81B	phenanthrene	560,000
82B	dibenzo(a,h)anthracene	43,000
83B	ideno(1,2,3-cd)pyrene	<20,000
84B	pyrene	380,000
129B	2,3,7,8-tetrachlorodibenzo-p-dioxin	ND

ND = None detected above the average reporting limit of 10,000 ppb for acids and 100,000 ppb for B/N.

Reported by: _____
Checked by: _____

*Trace concentrations detected below the PNA reporting limit of 20,000 ppb.

**Coelution

Additional Appendix VIII Compounds for Petroleum Refinery Industry[a,b]

CLIENT ID: Suction Pit Sample #2 (Oil Laer)

ERCO ID: 17514A

Results in: µg/kg (ppb) wet weight

Benzenethiol	ND
Indene	ND
Quinoline	ND
1-Methylnaphthalene	660,000
Dibenz(a,h)acridine[c]	ND

[a]Benz(j)fluoranthene, 7,12-dimethylbenz(a)anthracene are not reported due to lack of reference standard.

[b]Pyridine is too volatile for semivolatile analysis.

[c]Standard not available, response factor of isomeric dibenz(a,j)acridine used.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS-21 (Rock Island Refinery)

CLIENT ID: Suction Pit Sample #2 (Oil Layer)

ERCO ID: 17514A

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
C_4-Naphthalene isomer and C_1-Biphenyl isomer	BN	1041	1,300,000
C_2-Biphenyl isomer	BN	1122	780,000
C_1-Phenanthrene/anthracene isomer	BN	1252	1,300,000
C_1-Phenanthrene/anthracene isomer	BN	1269	1,600,000
C_2-Dibenzothiophene isomer	BN	1303	700,000
C_2-Phenanthrene/anthracene isomer	BN	1330	1,600,000
C_2-Pyrene isomer	BN	1532	1,500,000
C_2-Pyrene isomer	BN	1563	980,000
C_1-Chrysene isomer	BN	1649	1,700,000
C_2-Chrysene isomer	BN	1706	790,000

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS-21 (Rock Island Refinery)

CLIENT ID: Suction Pit Sample #2 (Oil Layer)

ERCO ID: 17514A

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
No unknowns	ACID		

CLIENT: HWMSS-21 (Rock Island Refinery)
CLIENT ID: Suction Pit Sample #2
ERCO ID: 17514C (Sediment layer)
SAMPLE RECEIVED: 7/2/85
ANALYSIS COMPLETED: 8/22/85
RESULTS IN: µg/kg (ppb) wet weight

ERCO / A Division of ENSECO

SUMMARY OF
ORGANIC PRIORITY POLLUTANT ANALYSIS

	ACID COMPOUNDS	
21A	2,4,6-trichlorophenol	ND
22A	p-chloro-m-cresol	ND
24A	2-chlorophenol	ND
31A	2,4-dichlorophenol	ND
34A	2,4-dimethylphenol	ND
57A	2-nitrophenol	ND
58A	4-nitrophenol	ND
59A	2,4-dinitrophenol	ND
60A	4,6-dinitro-o-cresol	ND
64A	pentachlorophenol	ND
65A	phenol	*460

	BASE/NEUTRAL COMPOUNDS	
1B	acenaphthene	*32,000
5B	benzidine	ND
8B	1,2,4-trichlorobenzene	ND
9B	hexachlorobenzene	ND
12B	hexachloroethane	ND
18B	bis(2-chloroethyl)ether	ND
20B	2-chloronaphthalene	ND
25B	1,2-dichlorobenzene	ND
26B	1,3-dichlorobenzene	ND
27B	1,4-dichlorobenzene	ND
28B	3,3-dichlorobenzidine	ND
35B	2,4-dinitrotoluene	ND
36B	2,6-dinitrotoluene	ND
37B	1,2-diphenylhydrazine	ND
39B	fluoranthene	92,000
40B	4-chlorophenyl phenyl ether	ND
41B	4-bromophenyl phenyl ether	ND
42B	bis(2-chloroisopropyl)ether	ND
43B	bis(2-chloroethoxy)methane	ND
52B	hexachlorobutadiene	ND
53B	hexachlorocyclopentadiene	ND
54B	isophorone	ND
55B	naphthalene	200,000
56B	nitrobenzene	ND
61B	N-nitrosodimethylamine	ND
62B	N-nitrosodiphenylamine	ND
63B	N-nitrosodi-n-propylamine	ND
66B	bis(2-ethylhexyl)phthalate	ND
67B	butyl benzyl phthalate	ND
68B	di-n-butylphthalate	ND
69B	di-n-octylphthalate	ND
70B	diethyl phthalate	ND
71B	dimethyl phthalate	ND
72B	benzo(a)anthracene	410,000
73B	benzo(a)pyrene	230,000
74B	3,4-benzofluoranthene**)	100,000
75B	benzo(k)fluoranthene **)	
76B	chrysene	710,000
77B	acenaphthylene	<38,000
78B	anthracene	130,000
79B	benzo(ghi)perylene	69,000
80B	fluorene	940,000
81B	phenanthrene	700,000
82B	dibenzo(a,h)anthracene	40,000
83B	ideno(1,2,3-cd)pyrene	<38,000
84B	pyrene	480,000
129B	2,3,7,8-tetrachlorodibenzo-p-dioxin	ND

ND = None detected above the average reporting limit of 760 ppb for acids and 190,000 ppb for B/N.

Reported by: _____
Checked by: _____

*Trace concentrations detected below the PNA reporting limit of 38,000 ppb.

**Coelution

Additional Appendix VIII Compounds for Petroleum Refinery Industry[a,b]

CLIENT ID: Suction Pit Sample #2

ERCO ID: 17514C

Results in: µg/kg (ppb) wet weight

Benzenethiol	ND
Indene	ND
Quinoline	ND
1-Methylnaphthalene	370,000
Dibenz(a,h)acridine[c]	ND

[a]Benz(j)fluoranthene, 7,12-dimethylbenz(a)anthracene are not reported due to lack of reference standard.

[b]Pyridine is too volatile for semivolatile analysis.

[c]Standard not available, response factor of isomeric dibenz(a,j)acridine used.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS-21 (Rock Island Refinery)

CLIENT ID: Suction Pit Sample #2 Sediment Layer)

ERCO ID: 17514C

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
C_3-Benzene isomer	ACID	440	3,100
Decane	ACID	492	5,100
Undecane	ACID	605	6,200
Dodecane	ACID	706	4,000
Tridecane	ACID	798	3,000
Tetradecane	ACID	883	3,100
Pentadecane	ACID	964	2,000
Hexadecane	ACID	1040	1,600
Heptadecane	ACID	1113	1,500
Nonadecane & C_1-Phenathrene/anthracene isomer	ACID	1248	2,200

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS 21 (Rock Island Refinery)

CLIENT ID: Suction Pit Sample #2 (Sediment Layer)

ERCO ID: 17514C

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
C_1-Phenanthrene/anthracene isomer	BN	1251	1,600,000
C_1-Phenanthrene/anthracene isomer	BN	1255	1,300,000
C_1-Phenanthrene/anthracene isomer	BN	1268	1,900,000
C_2-Phenanthrene/anthracene isomer	BN	1329	1,500,000
C_2-Phenanthrene/anthracene isomer	BN	1342	4,200,000
C_3-Phenanthrene/anthracene isomer	BN	1414	2,500,000
C_1-Pyrene isomer	BN	1476	1,700,000
C_2-Pyrene isomer	BN	1530	1,400,000
C_2-Pyrene isomer	BN	1540	1,400,000
C_1-Chrysene isomer	BN	1647	2,100,000

RESULTS OF TOTAL ANALYSIS (µg/g wet wt.)

Sample ID: Suction Pit Sample #2
ERCO ID: 17514A (Oil layer)

EP-Toxicity Metals

As	<2.5
Ba	9.2
Cd	<0.49
Cr	35
Pb	11
Hg	<0.049
Se	<2.5
Ag	<0.49

Additional Priority Pollutant Metals

Sb	<2.5
Be	<0.49
Cu	1.9
Ni	2.9
Tl	<2.5
Zn	19

Additional Metals

Ca	5,330
Fe	240
Mn	5.8
Na	2,740
V	5.4

Other Parameters

Total-CN	<0.347
Cl-Amen-CN	NA
TOC	328,000
Oil & Grease	NA
Sulfide	<0.36

% Solids NA

NA = Not applicable.

RESULTS OF TOTAL ANALYSIS (µg/g wet wt.)

Sample ID: Suction Pit Sample #2
ERCO ID: 17514C (Sediment layer)

EP-Toxicity Metals

As	6.5
Ba	92
Cd	<0.50
Cr	350
Pb	38
Hg	0.32
Se	<2.5
Ag	<0.50

Additional Priority Pollutant Metals

Sb	<2.5
Be	<0.50
Cu	35
Ni	18
Tl	<2.5
Zn	240

Additional Metals

Ca	63,500
Fe	3,810
Mn	66
Na	6,860
V	18

Other Parameters

Total-CN	<0.347
Cl-Amen-CN	NA
TOC	328,000
Oil & Grease	NA
Sulfide	<0.36

% Solids NA

NA = Not applicable.

RESULTS OF EP-TOXICITY LEACHATE ANALYSIS (mg/l)

Sample ID: Suction Pit Sample 2
ERCO ID: 17514

EP-Toxicity Metals

As	<0.23
Ba	0.61
Cd	<0.17
Cr	0.12
Pb	[1.7]*
Hg	0.0078
Se	<0.23
Ag	<0.084
Cr^{+6}	

Additional Priority Pollutant Metals

Sb	--
Be	<0.043
Cu	<0.84
Ni	<0.43
Tl	--
Zn	1.8

Additional Metals

Ca	42.5
Fe	3.0
Mn	0.074
Na	91
V	0.10

EP Extraction Data

Initial pH
Final pH
Acetic acid

*Additional concentration of mobile metal if metal concentration was present just below the detection limit.

CLIENT: HWMSS-21 (Rock Island Refinery)

SAMPLE RECEIVED: 7/1/85

ANALYSIS COMPLETED: 12/19/85

RESULTS IN: µg/g (ppm)

REPORTED BY:

CHECKED BY:

ENSECO INCORPORATED

PESTICIDE ANALYSIS

- Data Report -

Compound	Client ID: Suction Pit Sample #2 ERCO ID: 17514A (Oil layer)
89P aldrin	ND
90P dieldrin	ND
91P chlordane	ND
92P 4,4'-DDT	ND
93P 4,4'-DDE	ND
94P 4,4'-DDD	ND
95P alpha-endosulfan	ND
96P beta-endosulfan	ND
97P endosulfan sulfate	ND
98P endrin	ND
99P endrin aldehyde	ND
100P heptachlor	ND
101P heptachlor epoxide	ND
102P alpha-BHC	ND
103P beta-BHC	ND
104P gamma-BHC	ND
105P delta-BHC	ND
106P PCB-1242	ND
107P PCB-1254	ND
108P PCB-1221	ND
109P PCB-1232	ND
110P PCB-1248	ND
111P PCB-1260	ND
112P PCB-1016	ND
113P toxaphene	ND

ND = Not detected at or above reporting limit of 5.0 ppm.

CLIENT: HWMSS-21 (Rock Island Refinery)

SAMPLE RECEIVED: 7/1/85

ANALYSIS COMPLETED: 12/19/85

RESULTS IN: µg/g (ppm) wet wt.

REPORTED BY:

CHECKED BY:

ENSECO INCORPORATED

PESTICIDE ANALYSIS

- Data Report -

Compound	Client ID: Suction Pit Sample #2 ERCO ID: 17514C (Sediment layer)
89P aldrin	ND
90P dieldrin	ND
91P chlordane	ND
92P 4,4'-DDT	ND
93P 4,4'-DDE	ND
94P 4,4'-DDD	ND
95P alpha-endosulfan	ND
96P beta-endosulfan	ND
97P endosulfan sulfate	ND
98P endrin	ND
99P endrin aldehyde	ND
100P heptachlor	ND
101P heptachlor epoxide	ND
102P alpha-BHC	ND
103P beta-BHC	ND
104P gamma-BHC	ND
105P delta-BHC	ND
106P PCB-1242	ND
107P PCB-1254	ND
108P PCB-1221	ND
109P PCB-1232	ND
110P PCB-1248	ND
111P PCB-1260	ND
112P PCB-1016	ND
113P toxaphene	ND

ND = Not detected at or above reporting limit of 0.3 ppm.

APPENDIX A.5

- #1 Aeration Lagoon -

Date Sampled: 6/24/85

Analysis Completed: 7/5/85

All Results in: ng/g (ppb)

Reported by:

Checked by:

Client: HWMSS 21 Rock Island Refinery

ERCO / A Division of ENSECO

VOLATILE ORGANICS ANALYSIS

BY EPA METHOD 624

- Data Report -

Compounds	Minimum Reporting Limit	Client ID: ERCO ID:	#1 Aeration Lagoon/Sludge 17507
Chloromethane	4,100		ND
Bromomethane	4,100		ND
Vinyl chloride	4,100		ND
Chloroethane	4,100		ND
Methylene chloride	4,100		ND
Acetone	41,000		ND
Carbon disulfide	820		ND
1,1-dichloroethene	820		ND
1,1-dichloroethane	820		ND
Trans-1,2-dichloroethene	820		ND
Chloroform	820		9,000
1,2-dichloroethane	820		ND
2-Butanone	8,200		110,000
1,1,1-trichloroethane	820		ND
Carbon tetrachloride	820		ND
Vinyl acetate	820		ND
Bromodichloromethane	820		ND
1,2-dichloropropane	820		ND
Trans-1,3-dichloropropene	820		ND
Trichloroethene	820		ND
Dibromochloromethane	820		ND
1,1,2-trichloroethane	820		ND
Benzene	820		28,000
Cis-1,3-dichloropropene	820		ND
2-Chloroethylvinylether	820		ND
Bromoform	820		ND
2-Hexanone	8,200		ND
4-Methyl-2-pentanone	8,200		ND
Tetrachloroethene	820		ND
1,1,2,2-Tetrachloroethane	820		ND
Toluene	820		160,000
Chlorobenzene	820		ND
Ethylbenzene	820		44,000
Styrene	820		ND
Total xylenes	820		270,000

ND = Not detected.
Unknowns present - see attached sheet.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS 21

CLIENT ID: #1 Aeration Lagoon

ERCO ID: 17507

CAS NUMBER	COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
565593	Pentane, 2 3 dimethyl	VOA	816	96,000
16883480	Cyclopentane 1,2,4, trimethyl	VOA	1004	41,000
292648	Cyclooctane	VOA	1027	41,000
592278	Heptane, 2-methyl	VOA	1095	41,000
98828	Benzene, 1-methylethyl	VOA	1566	80,000

CLIENT: HWMSS-21 (Rock Island Refinery)
CLIENT ID: #1 Aeration Lagoon
ERCO ID: 17507
SAMPLE RECEIVED: 7/2/85
ANALYSIS COMPLETED: 8/21/85
RESULTS IN: µg/kg (ppb) dry weight

ERCO / A Division of ENSECO

SUMMARY OF
ORGANIC PRIORITY POLLUTANT ANALYSIS

	ACID COMPOUNDS	
21A	2,4,6-trichlorophenol	ND
22A	p-chloro-m-cresol	ND
24A	2-chlorophenol	ND
31A	2,4-dichlorophenol	ND
34A	2,4-dimethylphenol	1,600
57A	2-nitrophenol	ND
58A	4-nitrophenol	ND
59A	2,4-dinitrophenol	ND
60A	4,6-dinitro-o-cresol	ND
64A	pentachlorophenol	ND
65A	phenol	*150

	BASE/NEUTRAL COMPOUNDS	
1B	acenaphthene	*4,500
5B	benzidine	ND
8B	1,2,4-trichlorobenzene	ND
9B	hexachlorobenzene	ND
12B	hexachloroethane	ND
18B	bis(2-chloroethyl)ether	ND
20B	2-chloronaphthalene	ND
25B	1,2-dichlorobenzene	ND
26B	1,3-dichlorobenzene	ND
27B	1,4-dichlorobenzene	ND
28B	3,3-dichlorobenzidine	ND
35B	2,4-dinitrotoluene	ND
36B	2,6-dinitrotoluene	ND
37B	1,2-diphenylhydrazine	ND
39B	fluoranthene	19,000
40B	4-chlorophenyl phenyl ether	ND
41B	4-bromophenyl phenyl ether	ND
42B	bis(2-chloroisopropyl)ether	ND
43B	bis(2-chloroethoxy)methane	ND
52B	hexachlorobutadiene	ND
53B	hexachlorocyclopentadiene	ND
54B	isophorone	ND
55B	naphthalene	20,000
56B	nitrobenzene	ND
61B	N-nitrosodimethylamine	ND
62B	N-nitrosodiphenylamine	ND
63B	N-nitrosodi-n-propylamine	ND
66B	bis(2-ethylhexyl)phthalate	ND
67B	butyl benzyl phthalate	ND
68B	di-n-butylphthalate	ND
69B	di-n-octylphthalate	ND
70B	diethyl phthalate	ND
71B	dimethyl phthalate	ND
72B	benzo(a)anthracene	99,000
73B	benzo(a)pyrene	59,000
74B	3,4-benzofluoranthene**)	26,000
75B	benzo(k)fluoranthene **)	
76B	chrysene	170,000
77B	acenaphthylene	5,000
78B	anthracene	27,000
79B	benzo(ghi)perylene	20,000
80B	fluorene	16,000
81B	phenanthrene	150,000
82B	dibenzo(a,h)anthracene	14,000
83B	ideno(1,2,3-cd)pyrene	5,000
84B	pyrene	120,000
129B	2,3,7,8-tetrachlorodibenzo-p-dioxin	ND

ND = None detected above the average reporting limit of 740 ppb for acids and 18,000 ppb for B/N.

Reported by: _____
Checked by: _____

*Trace concentrations detected below the PNA reporting limit of 5,000 ppb.
**Coelution.

Additional Appendix VIII Compounds for Petroleum Refinery Industry[ab]

CLIENT ID: #1 Aeration Lagoon

ERCO ID: 17507

Results in: µg/kg (ppb) dry weight

Benzenethiol	ND
Indene	ND
Quinoline	ND
1-Methylnaphthalene	ND
Dibenz(a,h)acridine[c]	ND

[a]Standard not available, response factor of isomeric dibenz(a,j)acridine used.

[b]Benz(j)fluoranthene, 7,12-dimethylbenz(a)anthracene are not reported due to lack of reference standard.

[c]Pyridine is too volatile for semivolatile analysis.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS-21 (Rock Island Refinery)

CLIENT ID: #1 Aeration Lagoon

ERCO ID: 17507

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
n-Hexanoic Acid	Acid	652	500
Unknown	Acid	725	920
C_3-Phenol isomer	Acid	742	560
C_3-Phenol isomer	Acid	771	570
Unknown	Acid	1107	1,600
Unknown	Acid	1411	490

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS-21 (Rock Island Refinery)

CLIENT ID: #1 Aeration Lagoon

ERCO ID: 17507

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
C_1-Phenanthrene/anthracene isomer	BN	1257	550,000
C_1-Phenanthrene/anthracene isomer	BN	1269	430,000
C_2-Phenanthrene/anthracene isomer	BN	1330	350,000
C_2-Phenanthrene/anthracene isomer	BN	1343	900,000
C_3-Phenanthrene/anthracene isomer	BN	1411	340,000
C_3-Phenanthrener isomer	BN	1416	270,000
C_1-Pyrene isomer	BN	1465	430,000
C_2-Pyrene isomer	BN	1532	390,000
C_2-Pyrene isomer	BN	1564	270,000
C_1-Chrysene isomer	BN	1650	420,000

RESULTS OF TOTAL ANALYSIS (µg/g wet wt.)

Sample ID: #1 Aeration lagoon
ERCO ID: 17507

EP-Toxicity Metals	
As	12
Ba	140
Cd	0.88
Cr	480
Pb	44
Hg	0.74
Se	<2.3
Ag	<0.46

Totals

Additional Priority Pollutant Metals	
Sb	<2.3
Be	<0.46
Cu	59
Ni	21
Tl	<2.3
Zn	370

Additional Metals	
Ca	98,300
Fe	6,220
Mn	110
Na	9,190
V	42

Other Parameters	
Total-CN	0.879
Cl-Amen-CN	0.122
TOC	73,700
Oil & Grease	NA
Sulfide	1,680
% Solids	NA

NA = Not applicable.

RESULTS OF EP-TOXICITY LEACHATE ANALYSIS (mg/l)

Sample ID: #1 Aeration Lagoon
ERCO ID: 17507

EP-Toxicity Metals

As	<0.042
Ba	0.89
Cd	<0.027
Cr	0.040
Pb	0.22
Hg	<0.0006
Se	<0.042
Ag	<0.014
Cr^{+6}	

Additional Priority Pollutant Metals

Sb	--
Be	<0.007
Cu	<0.13
Ni	0.064
Tl	--
Zn	0.72

Additional Metals

Ca	252
Fe	3.3
Mn	5.8
Na	56
V	0.017

EP Extraction Data

Initial pH
Final pH
Acetic acid

CLIENT: HWMSS-21 (Rock Island Refinery)

SAMPLE RECEIVED: 7/1/85

ANALYSIS COMPLETED: 12/19/85

RESULTS IN: µg/g (ppm) dry wt.

REPORTED BY:

CHECKED BY:

ENSECO INCORPORATED

PESTICIDE ANALYSIS

- Data Report -

	Compound	Client ID: #1 Aeration lagoon ENSECO ID: 17507
89P	aldrin	ND
90P	dieldrin	ND
91P	chlordane	ND
92P	4,4'-DDT	ND
93P	4,4'-DDE	ND
94P	4,4'-DDD	ND
95P	alpha-endosulfan	ND
96P	beta-endosulfan	ND
97P	endosulfan sulfate	ND
98P	endrin	ND
99P	endrin aldehyde	ND
100P	heptachlor	ND
101P	heptachlor epoxide	ND
102P	alpha-BHC	ND
103P	beta-BHC	ND
104P	gamma-BHC	ND
105P	delta-BHC	ND
106P	PCB-1242	ND
107P	PCB-1254	ND
108P	PCB-1221	ND
109P	PCB-1232	ND
110P	PCB-1248	ND
111P	PCB-1260	ND
112P	PCB-1016	ND
113P	toxaphene	ND

ND = Not detected at or above reporting limit of 0.2 ppm.

APPENDIX A.6

- Trip Blank -

Date Received: 6/24/85

Analysis Completed: 7/5/85

All Results in: µg/l (ppb)

Reported by:

Checked by:

Client: HWMSS-21

ERCO / A Division of ENSECO

VOLATILE ORGANICS ANALYSIS

BY EPA METHOD 624

- Data Report -

Compounds	Minimum Reporting Limit	Client ID: ERCO ID:	Trip Blank 17504
Chloromethane	5		ND
Bromomethane	5		ND
Vinyl chloride	5		ND
Chloroethane	5		ND
Methylene chloride	5		ND
Acetone	50		ND
Carbon disulfide	1		ND
1,1-dichloroethene	1		ND
1,1-dichloroethane	1		ND
Trans-1,2-dichloroethene	1		ND
Chloroform	1		ND
1,2-dichloroethane	1		ND
2-Butanone	10		ND
1,1,1-trichloroethane	1		ND
Carbon tetrachloride	1		ND
Vinyl acetate	1		ND
Bromodichloromethane	1		ND
1,2-dichloropropane	1		ND
Trans-1,3-dichloropropene	1		ND
Trichloroethene	1		ND
Dibromochloromethane	1		ND
1,1,2-trichloroethane	1		ND
Benzene	1		ND
Cis-1,3-dichloropropene	1		ND
2-Chloroethylvinylether	1		ND
Bromoform	1		ND
2-Hexanone	10		ND
4-Methyl-2-pentanone	10		ND
Tetrachloroethene	1		ND
1,1,2,2-Tetrachloroethane	1		ND
Toluene	1		ND
Chlorobenzene	1		ND
Ethylbenzene	1		ND
Styrene	1		ND
Total xylenes	1		ND

ND = Not detected.

ERCO / A Division of ENSECO

VOLATILE ORGANICS ANALYSIS

BY EPA METHOD 624

- Data Report -

Client: HWMSS-21

Compounds	Minimum Reporting Limit	Client ID: ERCO ID:	Trip Blank 17504
Additional Compounds			
1,2-Dibromoethane	10		ND
1,4-Dioxane	110		ND

CLIENT: HWMSS-21
CLIENT ID: Trip Blank
ERCO ID: 17504
SAMPLE RECEIVED: 7/2/85
ANALYSIS COMPLETED: 8/8/85
RESULTS IN: µg/l (ppb)

ERCO / A Division of ENSECO

SUMMARY OF
ORGANIC PRIORITY POLLUTANT ANALYSIS

	ACID COMPOUNDS	
21A	2,4,6-trichlorophenol	ND
22A	p-chloro-m-cresol	ND
24A	2-chlorophenol	ND
31A	2,4-dichlorophenol	ND
34A	2,4-dimethylphenol	ND
57A	2-nitrophenol	ND
58A	4-nitrophenol	ND
59A	2,4-dinitrophenol	ND
60A	4,6-dinitro-o-cresol	ND
64A	pentachlorophenol	ND
65A	phenol	ND

	BASE/NEUTRAL COMPOUNDS	
1B	acenaphthene	ND
5B	benzidine	ND
8B	1,2,4-trichlorobenzene	ND
9B	hexachlorobenzene	ND
12B	hexachloroethane	ND
18B	bis(2-chloroethyl)ether	ND
20B	2-chloronaphthalene	ND
25B	1,2-dichlorobenzene	ND
26B	1,3-dichlorobenzene	ND
27B	1,4-dichlorobenzene	ND
28B	3,3-dichlorobenzidine	ND
35B	2,4-dinitrotoluene	ND
36B	2,6-dinitrotoluene	ND
37B	1,2-diphenylhydrazine	ND
39B	fluoranthene	ND
40B	4-chlorophenyl phenyl ether	ND
41B	4-bromophenyl phenyl ether	ND
42B	bis(2-chloroisopropyl)ether	ND
43B	bis(2-chloroethoxy)methane	ND
52B	hexachlorobutadiene	ND
53B	hexachlorocyclopentadiene	ND
54B	isophorone	ND
55B	naphthalene	ND
56B	nitrobenzene	ND
61B	N-nitrosodimethylamine	ND
62B	N-nitrosodiphenylamine	ND
63B	N-nitrosodi-n-propylamine	ND
66B	bis(2-ethylhexyl)phthalate	ND
67B	butyl benzyl phthalate	ND
68B	di-n-butylphthalate ----------	*10
69B	di-n-octylphthalate	ND
70B	diethyl phthalate ----------	*40
71B	dimethyl phthalate	ND
72B	benzo(a)anthracene	ND
73B	benzo(a)pyrene	ND
74B	3,4-benzofluoranthene	ND
75B	benzo(k)fluoranthene	ND
76B	chrysene	ND
77B	acenaphthylene	ND
78B	anthracene	ND
79B	benzo(ghi)perylene	ND
80B	fluorene	ND
81B	phenanthrene	ND
82B	dibenzo(a,h)anthracene	ND
83B	ideno(1,2,3-cd)pyrene	ND
84B	pyrene	ND
129B	2,3,7,8-tetrachlorodibenzo-p-dioxin	ND

ND = None detected above the average reporting limit of 100 ppb for acids and 100 ppb for B/N.

Reported by: _____
Checked by: _____

*Trace concentrations detected below the average reporting limit.

Additional Appendix VIII Compounds for Petroleum Refinery Industry[a,b]

CLIENT ID: Trip Blank

ERCO ID: 17504

Results in: µg/l (ppb)

Benzenethiol	ND
Indene	ND
Quinoline	ND
1-Methylnaphthalene	ND
Dibenz(a,h)acridine[c]	ND

[a]Benz(j)fluoranthene, 7,12-dimethylbenz(a)anthracene are not reported due to lack of reference standard.

[b]Pyridine is too volatile for semivolatile analysis.

[c]Standard not available, response factor of isomeric dibenz(a,j)acridine used.

ORGANICS ANALYSIS DATA SHEET — ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS-21

CLIENT ID: Trip Blank — ERCO ID: 17504

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
No unknowns	A		

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS-21

CLIENT ID: Trip Blank

ERCO ID: 17504

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
No unknowns	BN		

CLIENT: HWMSS-21

SAMPLE RECEIVED: 7/1/85

ANALYSIS COMPLETED: 12/19/85

RESULTS IN: ug/ml (ppm)

REPORTED BY:

CHECKED BY:

ERCO/A Divison of ENSECO

PESTICIDE ANALYSIS

- Data Report -

	Compound	Client ID: Trip Blank ERCO ID: 17504
89P	aldrin	ND
90P	dieldrin	ND
91P	chlordane	ND
92P	4,4'-DDT	ND
93P	4,4'-DDE	ND
94P	4,4'-DDD	ND
95P	alpha-endosulfan	ND
96P	beta-endosulfan	ND
97P	endosulfan sulfate	ND
98P	endrin	ND
99P	endrin aldehyde	ND
100P	heptachlor	ND
101P	heptachlor epoxide	ND
102P	alpha-BHC	ND
103P	beta-BHC	ND
104P	gamma-BHC	ND
105P	delta-BHC	ND
106P	PCB-1242	ND
107P	PCB-1254	ND
108P	PCB-1221	ND
109P	PCB-1232	ND
110P	PCB-1248	ND
111P	PCB-1260	ND
112P	PCB-1016	ND
113P	toxaphene	ND

ND = Not detected at or above reporting limit of 0.001 ppm.

APPENDIX A.7

- Procedural Blank -

Date Sampled: 6/24/85

Analysis Completed: 7/8/85

All Results in: ng/g (ppb)

Reported by:

Checked by:

Client: HWMSS 21 Rock Island Refinery

ERCO / A Division of ENSECO

VOLATILE ORGANICS ANALYSIS

BY EPA METHOD 624

- Data Report -

Compounds	Minimum Reporting Limit	Client ID: ERCO ID:	ERCO Procedural Blank 17516
Chloromethane	5		ND
Bromomethane	5		ND
Vinyl chloride	5		ND
Chloroethane	5		ND
Methylene chloride	5		ND
Acetone	50		ND
Carbon disulfide	1		ND
1,1-dichloroethene	1		ND
1,1-dichloroethane	1		ND
Trans-1,2-dichloroethene	1		ND
Chloroform	1		ND
1,2-dichloroethane	1		ND
2-Butanone	10		ND
1,1,1-trichloroethane	1		ND
Carbon tetrachloride	1		ND
Vinyl acetate	1		ND
Bromodichloromethane	1		ND
1,2-dichloropropane	1		ND
Trans-1,3-dichloropropene	1		ND
Trichloroethene	1		ND
Dibromochloromethane	1		ND
1,1,2-trichloroethane	1		ND
Benzene	1		ND
Cis-1,3-dichloropropene	1		ND
2-Chloroethylvinylether	1		ND
Bromoform	1		ND
2-Hexanone	10		ND
4-Methyl-2-pentanone	10		ND
Tetrachloroethene	1		ND
1,1,2,2-Tetrachloroethane	1		ND
Toluene	1		ND
Chlorobenzene	1		ND
Ethylbenzene	1		ND
Styrene	1		ND
Total xylenes	1		ND

ND = Not detected.
No unknowns.

CLIENT: HWMSS-21 (Rock Island Refinery)
CLIENT ID: ERCO Blank
ERCO ID: 17516
SAMPLE RECEIVED: 7/2/85
ANALYSIS COMPLETED: 8/19/85
RESULTS IN: µg/kg (ppb)

ERCO / A Division of ENSECO

SUMMARY OF
ORGANIC PRIORITY POLLUTANT ANALYSIS

	ACID COMPOUNDS	
21A	2,4,6-trichlorophenol	ND
22A	p-chloro-m-cresol	ND
24A	2-chlorophenol	ND
31A	2,4-dichlorophenol	ND
34A	2,4-dimethylphenol	ND
57A	2-nitrophenol	ND
58A	4-nitrophenol	ND
59A	2,4-dinitrophenol	ND
60A	4,6-dinitro-o-cresol	ND
64A	pentachlorophenol	ND
65A	phenol	ND

	BASE/NEUTRAL COMPOUNDS	
1B	acenaphthene	ND
5B	benzidine	ND
8B	1,2,4-trichlorobenzene	ND
9B	hexachlorobenzene	ND
12B	hexachloroethane	ND
18B	bis(2-chloroethyl)ether	ND
20B	2-chloronaphthalene	ND
25B	1,2-dichlorobenzene	ND
26B	1,3-dichlorobenzene	ND
27B	1,4-dichlorobenzene	ND
28B	3,3-dichlorobenzidine	ND
35B	2,4-dinitrotoluene	ND
36B	2,6-dinitrotoluene	ND
37B	1,2-diphenylhydrazine	ND
39B	fluoranthene	ND
40B	4-chlorophenyl phenyl ether	ND
41B	4-bromophenyl phenyl ether	ND
42B	bis(2-chloroisopropyl)ether	ND
43B	bis(2 chloroethoxy)methane	ND
52B	hexachlorobutadiene	ND
53B	hexachlorocyclopentadiene	ND
54B	isophorone	ND
55B	naphthalene	ND
56B	nitrobenzene	ND
61B	N-nitrosodimethylamine	ND
62B	N-nitrosodiphenylamine	ND
63B	N-nitrosodi-n-propylamine	ND
66B	bis(2-ethylhexyl)phthalate	ND
67B	butyl benzyl phthalate	ND
68B	di-n-butylphthalate	ND
69B	di-n-octylphthalate	ND
70B	diethyl phthalate	ND
71B	dimethyl phthalate	ND
72B	benzo(a)anthracene	ND
73B	benzo(a)pyrene	ND
74B	3,4-benzofluoranthene	ND
75B	benzo(k)fluoranthene	ND
76B	chrysene	ND
77B	acenaphthylene	ND
78B	anthracene	ND
79B	benzo(ghi)perylene	ND
80B	fluorene	ND
81B	phenanthrene	ND
82B	dibenzo(a,h)anthracene	ND
83B	ideno(1,2,3-cd)pyrene	ND
84B	pyrene	ND
129B	2,3,7,8-tetrachlorodibenzo-p-dioxin	ND

ND = None detected above the average reporting limit of 500 ppb for acids and 500 ppb for B/N.

Reported by: _____
Checked by: _____

Additional Appendix VIII Compounds for Petroleum Refinery Industry[a,b]

CLIENT ID: ERCO Blank
ERCO ID: 17516
Results in: µg/kg (ppb)

Benzenethiol	ND
Indene	ND
Quinoline	ND
1-Methylnaphthalene	ND
Dibenz(a,h)acridine[c]	ND

[a]Benz(j)fluoranthene, 7,12-dimethylbenz(a)anthracene are not reported due to lack of reference standard.

[b]Pyridine is too volatile for semivolatile analysis.

[c]Standard not available, response factor of isomeric dibenz(a,j)acridine used.

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS-21 (Rock Island Refinery)

CLIENT ID: ERCO Blank

ERCO ID: 17516

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
No unknown	ACID		

ORGANICS ANALYSIS DATA SHEET

ERCO / A DIVISION OF ENSECO, INC.

CLIENT: HWMSS-21 (Rock Island Refinery)

CLIENT ID: ERCO Blank

ERCO ID: 17516

COMPOUND NAME	FRACTION	SCAN NO.	ESTIMATED CONCENTRATION (µg/kg)
4-Hydroxy-4-methyl-2-pentanone (aldol condensation product)	BN	320	230,000

RESULTS OF TOTAL ANALYSIS (µg/g wet wt.)

Sample ID: Procedural Blank
ERCO ID: 17516 (Blank)

EP-Toxicity Metals

As	<0.25
Ba	<1.3
Cd	<0.50
Cr	<5.0
Pb	<5.0
Hg	<0.050
Se	<0.25
Ag	<0.50

Additional Priority Pollutant Metals

Sb	<0.25
Be	<0.13
Cu	<5.0
Ni	<2.5
Tl	<0.25
Zn	<0.50

Additional Metals

Ca	6.7
Fe	5.0
Mn	<0.25
Na	106
V	<1.3

Other Parameters

Total-CN
Cl-Amen-CN
TOC
Oil & Grease
Sulfide

% Solids

NA = Not applicable.

RESULTS OF EP-TOXICITY LEACHATE ANALYSIS (mg/l)

Sample ID: Procedural Blank
ERCO ID: 17516B

EP-Toxicity Metals

As	<0.010
Ba	<0.10
Cd	<0.020
Cr	0.050
Pb	<0.20
Hg	<0.0004
Se	<0.010
Ag	<0.010
Cr^{+6}	

Additional Priority Pollutant Metals

Sb	--
Be	<0.005
Cu	<0.14
Ni	<0.050
Tl	--
Zn	<0.39

Additional Metals

Ca	0.15
Fe	0.041
Mn	<0.02
Na	0.30
V	<0.050

EP Extraction Data

Initial pH
Final pH
Acetic acid

CLIENT: HWMSS - 21 (Rock Island Refinery)

SAMPLE RECEIVED: 7/1/85

ANALYSIS COMPLETED: 12/19/85

RESULTS IN: µg/ml (ppm)

REPORTED BY:

CHECKED BY:

ERCO/A Division of ENSECO

PESTICIDE ANALYSIS

- Data Report -

Compound	Client ID: / ERCO ID:	Procedure Blank 17516B
89P Aldrin		ND
90P Dieldrin		ND
91P Chlordane		ND
92P 4,4'-DDT		ND
93P 4,4'-DDE		ND
94P 4,4'-DDD		ND
95P alpha-Endosulfan		ND
96P beta-Endosulfan		ND
97P Endosulfan sulfate		ND
98P Endrin		ND
99P Endrin aldehyde		ND
100P Heptachlor		ND
101P Heptachlor epoxide		ND
102P alpha-BHC		ND
103P beta-BHC		ND
104P gamma-BHC		ND
105P delta-BHC		ND
106P PCB-1242		ND
107P PCB-1254		ND
108P PCB-1221		ND
109P PCB-1232		ND
110P PCB-1248		ND
111P PCB-1260		ND
112P PCB-1016		ND
113P Toxaphene		ND

ND = Not detected at or above sample reporting limit of 0.01 ppm.

APPENDIX A.8

- Matrix Spike -

RESULTS OF VOLATILE ORGANIC SPIKE RECOVERIES

ERCO ID: 17515

1,1-dichloroethylene	58%
Trichloroethylene	83%
Benzene	102%
Toluene	61%
Chlorobenzene	100%

RESULTS OF SEMIVOLATILE ORGANIC SPIKE RECOVERIES

ERCO ID: 17515

Acid Compounds

p-chloro-m-cresol	96%
2-chlorophenol	105%
4-nitrophenol	73%
Pentachlorophenol	89%
Phenol	65%

Base/Neutral Compounds

Acenaphthene	0%
1,2,4-trichlorobenzene	0%
1,4-dichlorobenzene	0%
2,4-dinitrotoluene	0%
N-nitrosodi-n-propylamine	0%
Di-n-butyl phthalate	0%
Pyrene	0%

RESULTS OF TOTAL ANALYSIS (Spike Recovery)

Sample ID: Prep. Spike ERCO ID: 17515	% Recovery
EP-Toxicity Metals	
As	39
Ba	69
Cd	106
Cr	160
Pb	95
Hg	103
Se	87
Ag	72
Additional Priority Pollutant Metals	
Sb	*
Be	112
Cu	104
Ni	95
Tl	*
Zn	98
Additional Metals	
Ca	-
Fe	-
Mn	107
Na	-
V	100

*Not in spiking solution.
(-) = Spike <10% of total.

RESULTS OF EP-TOXICITY ANALYSIS (Spike Recovery)

Sample ID: 17507	Filtrate	THF/TOL	EP Leachate
EP-Toxicity Metals			
As	88	102	92
Ba	98	101	97
Cd	97	102	96
Cr	98	100	96
Pb	100	103	99
Hg	--	--	--
Se	90	92	83
Ag	97	95	95
Additional Priority Pollutant Metals			
Sb	--	--	--
Be	96	99	98
Cu	95	101	92
Ni	95	101	91
Tl	--	--	--
Zn	99	100	97
Additional Metals			
Ca	101	101	104
Fe	99	103	100
Mn	97	100	101
Na	103	101	101
V	98	101	97

RESULTS OF EP-TOXICITY LEACHATE ANALYSIS (mg/l)

Sample ID: #1 Aeration Lagoon
ERCO ID: 17507 Duplicate

EP-Toxicity Metals

As	<0.046
Ba	0.90
Cd	<0.032
Cr	0.054
Pb	<0.32
Hg	<0.0008
Se	<0.046
Ag	<0.016
Cr^{+6}	

Additional Priority Pollutant Metals

Sb	--
Be	<0.008
Cu	<0.16
Ni	0.074
Tl	--
Zn	0.65

Additional Metals

Ca	280
Fe	2.4
Mn	7.2
Na	62
V	<0.079

EP Extraction Data

Initial pH
Final pH
Acetic acid

RESULTS OF PESTICIDE SPIKE RECOVERIES

ERCO ID: 17515

Aldrin	0%
Dieldrin	0%
4',4'-DDT	0%
Endrin	0%
Heptachlor	0%
gamma-BHC	0%

APPENDIX B

CHAIN OF CUSTODY RECORD

Proj No.	Project Name	Samplers (Signature)
	Rock Island Recovery	Timothy J. Ward

Date	Time	Comp.	Grab	Sample Identification	No. of Containers	Type of Container	VOA + TOC					Short Holding Time	Remarks	Condition Upon Receipt G, B, L, etc.*
6/24/85	4:45	pm		R.I West separator Rep1	4		3						VOA's & TOC in	
	↓	↓		R.I West ↓ Rep2	4		3						small cooler	
	4:20 pm		✓	R.I Filter CAKE	5		3							
	5:15	pm		R.I Suction Pit Rep1	4		3							
	↓			↓ ↓ Rep2	4		3							
	4:50 pm			R.I Holding Tank Rep1	4		3						Composite Sample	
	↓			↓ ↓ ↓ Rep2	4		3						↓	
↓														
6/24	5:45 pm		✓	R.I #1 Aeration Lagoon	3		3							

Relinquished by: (Signature)	Date Time	Received by: (Signature)
T. Ward	6/26/85 1000	Cindy Tuttle
Relinquished by: (Signature)	Date Time	Received by: (Signature)
Relinquished by: (Signature)	Date Time	Received for Laboratory by: (Signature)

Shipping Container Condition: (D–Damaged, S–Sealed, L–Locked, O–Odor)

Remarks

HOLD FOR IAN & FURTHER INSTRUCTIONS, EXCEPT VOA + TOC. Remove ice from cooler & refrigerate to 4°C. (See J. Maloney if

*G–Good, B–Broken, L–Leaking, M–Missing, U–Unlabeled
NI–No Ice, I–Ice, SI–Seal In Tack, SB–Seal Broken

APPENDIX C